

**CONTRACT DOCUMENTS
FOR
HILLFIELD, REX BLVD &
OLD ADAMS WATER MAIN**

**CITY OF AUBURN HILLS
AUBURN HILLS, MI 48326**

**OHM Advisors
Consulting Engineers
34000 Plymouth Road
Livonia, Michigan 48150**

0120-20-0400
May 10, 2021

Hillfield, Rex Blvd & Old Adams Water Main

City of Auburn Hills

0120-20-0400

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ADVERTISEMENT FOR BID

Hillfield, Rex Blvd & Old Adams Water Main
City of Auburn Hills
May 10, 2021

Sealed Bids for Hillfield, Rex Blvd & Old Adams Water Main will be received at the office of the City of Auburn Hills until 2:00 pm local time, on May 26, 2021, by the office of the City Clerk located at 1827 North Squirrel Road, Auburn Hills, MI 48326. The approximate quantities of major items of work involved are as follows:

Water main connection between Executive Hills Blvd and Hillfield Road, crossing M-59.
Replacement of water main on Rex Blvd and extension of water main along Old Adams Road.

The Contract Documents for this project are on file and may be examined on and after 4:00 pm, May 10, 2021, at the following locations: the office of the ENGINEER, Orchard, Hiltz, & McCliment, Inc., d/b/a OHM Advisors, 34000 Plymouth Road, Livonia, MI 48150; Dodge Data & Analytics, dodgeproducts.construction.com; CMD Group, cmdgroup.com; and the Construction Association of Michigan (CAM), buildwithcam.com.

Digital copies thereof may be obtained on or after 4:00 pm, local time, May 10, 2021 from the online plan room section of the website of the ENGINEER, www.ohm-advisors.com. A digital download fee may apply. Hard copies are available upon request for a fee.

Bid Security in the form of a Cashier's Check or Bid Bond for a sum no less than 5% of the amount of the Bid will be required with each Bid.

The OWNER reserves the right to accept any Bid, reject any Bid, or waive irregularities in Bids.

No Bid may be withdrawn for a period of 60 calendar days after the scheduled closing time for receipt of the Bids.

No pre-bid meetings are scheduled for this project.

Laura Pierce, City Clerk
City of Auburn Hills

INSTRUCTIONS TO BIDDERS

1. BIDS

- A. Sealed Bids will be received as per Advertisement for Bids.
- B. Bid Forms shall be submitted only on forms provided by the ENGINEER and shall be of the type specified in the Bid Form.
- C. Bid Forms must be completed legibly in ink or by typewriter. In case of a discrepancy between the unit price and the extended amount, the unit price shown shall govern. Illegibility of any figure or word in the Bid Form may be sufficient cause for rejection of the Bid by the OWNER.
- D. Bid Forms shall be enclosed in sealed envelopes marked with the name of the project and Bidder and shall be delivered to the OWNER at the place specified in the Advertisement for Bids on or before the time specified in the Advertisement for Bids.
- E. Bid Forms shall be made in full conformity with all the conditions set forth in the drawings and in these specifications

2. NAME AND STATUS OF BIDDER

- A. The name and legal status of Bidder, that is, as a corporation, partnership or individual, shall be stated in the Bid Form.
- B. Anyone signing a Bid Form as an agent of another or others must submit with the Bid Form legal evidence of his authority to do so.
- C. The place of residence of each Bidder, or the office address in the case of a firm or company, with county and state, must

be given after his signature. Phone and fax numbers are also required.

3. BID SECURITY

Each Bid must be in the form requested in the Advertisement for Bid. The CONTRACTOR shall complete and sign the Bid Guarantee form (page BG-1). If a Bid Bond is requested, it must be from a Treasury Listed surety company licensed to do business in the state of Michigan in the amount as stated in the Advertisement for Bid, payable to the OWNER as a guarantee on the part of the Bidder that he will, if called upon, enter into the attached Agreement.

4. BONDS

- A. CONTRACTOR will be required to furnish performance and payment bonds each equal to one-hundred percent (100%) of the Contract Sum. The bonds shall be the OWNER's guarantee of the faithful performance and payment of all the CONTRACTOR's obligations under the Agreement. These bonds shall remain in effect for the period as stated in each bond's provisions.
- B. Maintenance and Guarantee Bonds shall be required.

5. INSPECTION OF SITE

- A. Before submitting a Bid Form, each Bidder shall personally inspect the site of the proposed work to arrive at a clear understanding of the conditions under which the work is to be done.
- B. Each Bidder shall be held to have compared the premises with the Bid documents and to have satisfied himself as to conditions of the premises, existing construction and any other conditions

affecting the carrying out of the work before delivery of his Bid Form.

- C. No allowance or extra consideration on behalf of the CONTRACTOR will subsequently be allowed by reason of error or oversight on the part of the CONTRACTOR or on account of interference by the OWNER's or other CONTRACTOR's activities.

6. TIME OF COMPLETION

Time of completion will be as stated in the Agreement.

7. EXPLANATION TO BIDDERS BY ADDENDA

- A. Neither the OWNER nor the ENGINEER will give verbal answers to inquiries regarding the meaning or intent of the Contract Documents prior to award of the Contract. Any verbal statements regarding same by any person prior to the award shall be without legal effect.
- B. Explanations desired by Bidders shall be requested of the ENGINEER in writing and, if explanations are necessary, a reply will be made in the form of an addendum, a copy of which will be forwarded to each Bidder of Record whose work is affected.
- C. Addenda issued to Bidders prior to date of receipt of Bid Forms shall become a part of the Contract Documents, and all Bid Forms shall include the work described in the Addenda.
- D. No inquiry received within four (4) business days of the date fixed for opening of the Bids will be given consideration.
- E. Failure of the ENGINEER to send, or the Bidder to receive, any such interpretations shall not relieve the

Bidder from obligation under his Bid as submitted.

- F. Bidder of Record is defined as an individual, partnership or corporation having purchased a set of Bid Documents from the ENGINEER.

8. EXPERIENCE AND FINANCIAL STATEMENT

- A. It is the intention of the OWNER to award the Contract to a contractor fully capable, both financially and as regards to experience to perform and complete the work in a satisfactory manner. Each Bidder must complete the Statement of Qualifications, which follows the Bid Form. If required by the OWNER, each Bidder under consideration may be required to submit additional evidence of qualifications.
- B. Each Bidder under consideration must be able to demonstrate that the Bidder has successfully completed projects of a similar nature and scope within the last two years.

9. SUBCONTRACTORS

Bidder shall submit to OWNER a list of all subcontractors and other persons and organizations (including those who are to furnish the principal items of material and equipment) proposed for those portions of work as to which such identification is so required. If requested by the OWNER, the apparent successful Bidder and any other Bidder so requested, will, within ten (10) days after the day of Bid opening, submit a Statement of Qualifications with pertinent information as to similar projects and other evidence of qualification for each such subcontractor, person and organization if requested by the OWNER. If the OWNER or ENGINEER, after due investigation, has reasonable objection to any proposed subcontractor, other person or organization, OWNER may request the apparent successful Bidder to submit an acceptable

substitute without an increase in Bid price. If the apparent successful Bidder declines to make any such substitutions, the Contract shall not be awarded to such Bidder, but his declining to make any such substitution will not constitute grounds for sacrificing his Bid Security. Any subcontractor, other person or organization so listed and to whom the OWNER or ENGINEER does not make written objection prior to signing of the Agreement will be deemed acceptable to the OWNER and ENGINEER.

10. AWARD OF CONTRACT

The OWNER reserves the right to accept any Bid, to reject any or all Bids, and to waive defects or irregularities in any Bid for any reason or no reason at all. The OWNER also reserves the right to award some, none, or all of the Contract.

11. LIQUIDATED DAMAGES/INCENTIVES

- A. If the CONTRACTOR fails to complete all the work within the time stipulated, he will be assessed liquidated damages as set forth in the Agreement.
- B. If set forth in the Agreement, incentives will be paid by OWNER to CONTRACTOR at the rate specified in the Agreement, when the work is completed prior to the time specified in the Agreement.

12. TAXES

The Bidder shall include in the base Bid and shall pay all applicable federal, state and local taxes of whatever character and description.

End of Section

SUPPLEMENTAL INSTRUCTIONS TO BIDDERS

These Supplemental Instructions to Bidders (SIB) amend or supplement the Instructions to Bidders. All provisions that are not so amended or supplemented remain in full force and effect.

A. Time of Completion & Construction Schedule

Prior to the execution of the Contract, the CONTRACTOR shall submit an outline of his proposed order of work and indicate dates for completing the major items of work. Major items shall be considered to be the water main connection from Executive Hills Blvd to Hillfield Road, the replacement of water main along Rex Blvd, and the extension of water main along Old Adams Road. Please note that the City reserves the right to remove any and all portions of the project as they deem necessary. This schedule, when approved by the OWNER, shall become part of the Contract.

A pre-construction meeting shall be arranged prior to the start of work. The CONTRACTOR shall bring a tentative schedule to the pre-construction meeting. At this time, all Contract requirements shall be reviewed.

It is anticipated that construction will begin on July 6, 2021. The CONTRACTOR shall complete the proposed work, including final tests thereof, in order to have all pavement maintenance operations finished as of the substantial completion date. Final cleanup and restoration shall be finished by the project completion date, unless otherwise directed in writing by the OWNER or its ENGINEER.

Summary of anticipated dates:

Final Contract Award	June 21, 2021
Notice to Proceed	June 22, 2021
Construction Start Date	July 6, 2021
Substantial Completion Date	October 1, 2021
Project Completion Date	October 15, 2021

All requests for extensions of time shall be submitted in writing in accordance with Section 15 of the General Conditions. Such requests shall:

1. Detail the reason for the request.
2. Provide a realistic revised completion date.
3. Indicate any other areas that may be impacted by such an extension.

The CONTRACTOR shall request a deadline extension as soon as it has become apparent the completion date is unreasonable. In no case will a request be considered if it is submitted after the originally required completion date has passed.

Please note that the City reserves the right to remove any and all portions of the project as they deem necessary.

B. Permits

The following permits will be required for project construction. The CONTRACTOR is required to comply with all terms and conditions of the permit as incidental to the unit prices bid and no extra compensation will be allowed.

- a. Permitting Agency: EGLE Water Main Permit
Contact at Agency: Abuzoha Islam
Phone number: 248-504-9142
Permit Fee: _____
Bond Amount (if applicable): _____
Date of Application: Pending
Person Responsible for Acquiring the Permit: City of Auburn Hills
Date Permit issued if already in hand: _____
- b. Permitting Agency: MDOT ROW Permit
Contact at Agency: Fred Roeder
Phone number: 248-208-5894
Permit Fee: _____
Bond Amount (if applicable): _____
Date of Application: Pending
Person Responsible for Acquiring the Permit: City of Auburn Hills
Date Permit issued if already in hand: _____

Application has been made by the Engineer for the permits identified above. Unless otherwise indicated, the CONTRACTOR must secure the permits prior to the start of construction and shall be responsible for all associated fees, deposits, bonds, proof of insurance, etc. The Contractor shall also be responsible for arranging for inspection by the governing agencies.

Work cannot proceed until all permits are obtained.

C. Pre-bid Meeting

A pre-bid meeting will not be held for this project.

INSURANCE SPECIFICATIONS

1. LIABILITY OF CONTRACTOR

The Contractor shall take all responsibility for the work and shall provide barricades, watchmen and lights, and take all precautions for preventing injuries to persons and property on or about the work; shall bear all losses resulting to him on account of the amount or character of the work or because the nature of the ground in which the work is done is different from what was estimated or expected, or on account of weather, floods, elements or other cause; and shall assume defense of, indemnify and save harmless the party of the first part and its individual officers and agents from all claims relating to labor, equipment and materials furnished for the work, inventions, patents and patent rights used in doing the work, also to injuries to any person or property received or sustained by or from the CONTRACTOR, his agents or employees.

The mention of any specific duty or liability of the CONTRACTOR in any part of the specifications shall not be construed as a limitation or restriction upon any general liability or duty imposed upon the CONTRACTOR by the specifications.

INDEMNIFICATION - HOLD HARMLESS AGREEMENT

The CONTRACTOR agrees to indemnify, defend, and save harmless the OWNER and ENGINEER, their consultants, agents, and employees, from and against all loss or expense (including costs and attorney's fees) by reason of liability imposed by law upon the OWNER and ENGINEER, their consultants, agents, and employees for damages to property and for damages because of bodily injury, including death at any time resulting therefrom, arising out of or in consequence of the performance of this work, whether such injuries to persons or damage to property is due, or claimed to be due, to the negligence of the CONTRACTOR, his subcontractors, the OWNER, the ENGINEER, and their consultants, agents, and employees, except only such injury or damage as shall have been occasioned by the sole negligence of the

OWNER, the ENGINEER, and their agents and/or consultants.

COMPOSITION OF THE CONTRACTOR

If the CONTRACTOR hereunder is comprised of more than one legal entity, each such entity shall be jointly and severally liable hereunder.

It is further required that all contractors providing services or performing duties for the City of Auburn Hills shall enter into a Hold Harmless Agreement with the City and all other entities as set forth in the ACORD certificate mentioned in Item 2.1 modification below. This agreement shall hold the City and its employees, officers, agents and representatives harmless from any and all claims incurred while the contractor is performing work, jobs, duties, etc. on the City's behalf.

2. INSURANCE

2.1. Insurance Required of the CONTRACTOR:

Prior to commencement of work, the CONTRACTOR shall purchase and maintain during the term of the project such insurance as will protect him, the OWNER(s), and Orchard, Hiltz & McClimment, Inc., Consulting Engineers, from claims arising out of the work described in this Contract and performed by the CONTRACTOR, subcontractor(s) or sub-subcontractor(s) consisting of:

2.1.1. Workers' Compensation Insurance including Employer's Liability to cover employee injuries or disease compensable under the Workers' Compensation Statutes of the states in which work is conducted under this Contract; disability benefit laws, if any; or Federal compensation acts such as U.S. Longshoremen or Harbor Workers', Maritime Employment, or Railroad Compensation Act(s), if applicable. Self-insurance plans approved by the regulatory authorities

in the state in which work on this project is performed are acceptable.

2.1.2. A Comprehensive General Liability policy to cover bodily injury to persons other than employees and for damage to tangible property including loss of use thereof, including the following exposures:

- A. All premises and operations.
- B. Explosion, collapse and underground damage.
- C. Contractor's Protective coverage for independent contractors or subcontractors employed by him.
- D. Contractual Liability for the obligation assumed in the Indemnification or Hold Harmless agreement found under Part I of this Section.
- E. The usual Personal Injury Liability endorsement with no exclusions pertaining to employment.
- F. Products and Completed Operations coverage. This coverage shall extend through the contract guarantee period.

2.1.3. A Comprehensive Automobile Liability policy to cover bodily injury and property damage arising out of the ownership, maintenance or use of any motor vehicle, including owned, non-owned and hired vehicles. In light of the standard policy provisions concerning (a) loading and unloading, and b) definitions pertaining to motor vehicles licensed for road use vs. unlicensed or self-propelled construction equipment, it is strongly recommended that Comprehensive General Liability and Comprehensive Auto Liability be written by the same insurance carrier, though not necessarily in one policy.

2.1.4. CONTRACTOR will purchase for the OWNER an Owner's Protective Liability policy to protect the OWNER; the ENGINEER (Orchard, Hiltz & McCliment, Inc.); their consultants, agents, employees and such public

corporations in whose jurisdiction the work is located for their contingent liability for work performed by the CONTRACTOR, the subcontractor(s) or the sub-subcontractor(s) under this Contract.

2.1.5. CONTRACTOR shall purchase a Builder's Risk-Installation Floater in a form acceptable to the OWNER covering property of the project for the full cost of replacement as of the time of any loss which shall include, as named insureds, (a) the CONTRACTOR, (b) all subcontractors, (c) all sub-subcontractors, (d) the OWNER, and Orchard, Hiltz & McCliment, Inc., Consulting Engineers, as their respective interests may prove to be at the time of loss, covering insurable property which is the subject of this Contract, whether in place, stored at the job site, stored elsewhere, or in transit at the risk of the insured(s). Coverage shall be effected on an "All Risk" form, all direct physical loss from all causes except those that are expressly excluded in the policy including but not limited to the perils of fire, wind, collapse, vandalism, theft and earthquake, with exclusions normal to the cover. The CONTRACTOR may arrange for such deductibles as he deems to be within his ability to self-assume, but he will be held solely responsible for the amount of such deductible and for any co-insurance penalties. Any insured loss shall be adjusted with the OWNER and CONTRACTOR and paid to the OWNER and CONTRACTOR as Trustee for the other insureds.

2.1.6. Umbrella or Excess Liability

The OWNER or its representative may, for certain projects, require limits higher than those stated in paragraph. 2.2 that follows. CONTRACTOR is granted the option of arranging coverage under a single policy for the full limit required or by a combination of underlying policies with the balance provided by an Excess or

Umbrella Liability policy equal to the total limit(s) requested. Umbrella or Excess policy wording shall be at least as broad as the primary or underlying policy(ies) and shall apply both to the CONTRACTOR's general liability and to his automobile liability insurance.

2.1.7. Railroad Protective Liability

Where such an exposure exists, the CONTRACTOR will provide coverage in the use of each railroad company having jurisdiction over rights-of-way across which work under the Contract is to be performed. The form of policy and limits of liability shall be determined by the railroad company(ies) involved.

2.1.8. Certificate Requirement

An ACORD certificate of insurance, or its equivalent, shall be furnished to the City of Auburn Hills at 1827 North Squirrel Road, Auburn Hills, Michigan 48326 evidencing insurance in force for the duration of and applicable to this contract with an insurance company acceptable to the City of Auburn Hills with a minimum A.M. BEST rating of "A".

The description section of ACORD form is to read: "It is understood and agreed that the following shall be additional insured: The City of Auburn Hills, including all elected and appointed officials, all employees and volunteers, all boards, commissions, and/or authorities, including but not limited to the Tax Increment Finance Authority, Brownfield Redevelopment Authority and the Building Authority, and their employees, representatives and volunteers." The coverage of the additional insured shall be endorsed and shall be primary to the additional insured and not contributing with any other insurance or similar protection available to the additional insured. This shall not apply to the contractor's required worker's compensation/employer's liability.

The Description of Operation section of the Certificate shall also name or describe the project and/or event for which coverage is provided.

2.2. Limits of Liability

The required limits of liability for insurance coverages requested in Section 2.1 shall be not less than the following:

2.2.1. Worker's Compensation

The CONTRACTOR shall procure and maintain during the life of the contract, statutory Michigan Workers Compensation and Employers Liability (E.L.) Insurance for all employees employed at or in the vicinity of the Contractor's property or any property used in connection with the Contractor's operation or in carrying out any work related to this contract.

Michigan Workers Compensation and Employers Liability Insurance shall be procured and maintained with the following limits of liability:

- I. \$100,000 E.L. each accident
- II. \$100,000 E.L. each disease – each employee
- III. \$500,000 E.L. Disease – Policy Limit.

This insurance shall comply with all applicable rules and regulations of the State of Michigan and shall be in an insurance company acceptable to the City of Auburn Hills.

2.2.2. Comprehensive General Liability

The CONTRACTOR shall procure and maintain during the life of the contract General Liability insurance (affording coverage not less than ISO Commercial General Liability coverage form):

- I. Check mark indicating occurrence as opposed to claims made form
- II. Limits of Liability:
\$2,000,000 each occurrence
\$4,000,000 general and products-completed operations aggregates
- III. Personal Injury

\$2,000,000

Acceptable alternate limits are combinations of primary and excess or umbrella limits to equal not less than those mentioned above.

2.2.3. The CONTRACTOR shall procure and maintain during the life of the contract Comprehensive Automobile Insurance and shall:

- I. Check mark indicating coverage as to any automobile
- II. Certificate must reflect Michigan "No Fault" PIP and PPI statutory coverages are also afforded
- III. Limits of Liability: \$2,000,000 combined single limit.

Acceptable alternate limits are combinations of primary and excess or umbrella limits to equal not less than those mentioned above.

2.2.4. Owner's Protective

The Contractor shall procure and maintain during the life of the contract an Owner's and Contractor's Protective Liability Insurance in the name of the City of Auburn Hills in an amount not less than \$2,000,000 per occurrence, and \$4,000,000 aggregate for injuries, including death, to persons and property damage including loss of use thereof. This insurance shall be provided by an insurance company that is acceptable to the City of Auburn Hills.

2.2.5. Builder's Risk-Installation Floater

Cost to replace at time of loss

2.2.6. Umbrella or Excess Liability

\$2,000,000

2.3. Insurance - Other Requirements

2.3.1. Notice of Cancellation or Intent Not to Renew

Policies will be endorsed to provide that at least thirty (30) days written notice shall be given to the OWNER and the

ENGINEER of cancellation or of intent not to renew.

2.3.2. Evidence of Coverage

Prior to the commencement of work, the CONTRACTOR shall furnish to the OWNER, Certificates of Insurance in force on the Owner's Form of Certificate provided. Other forms of certificate are acceptable only if (1) they include all items prescribed in the Owner's Form of Certificate, including agreement to cancellation provisions outlined in Paragraph 2.3.1 above, and (2) they have the written approval of the OWNER and ENGINEER. The OWNER reserves the right to request complete copies of the policies if deemed necessary to ascertain details of coverage not provided by the certificates. Such policy copies shall be "Originally Signed Copies," and so designated.

The Contractor agrees that he/she will file all required Certificates of Insurance satisfactory to the City of Auburn Hills with the City of Auburn Hills simultaneously with or prior to the execution of this contract indicating that the insurance required herein has been issued and is in full force and effect.

Further, the Contractor will provide updated certificates annually prior to the policies expiration dates, to indicate that the policies and conditions required hereunder are in full force and effect during the life of this contract.

It is understood and agreed that thirty (30) days advance written notice of cancellation; non-renewal, reduction and/or material change in coverage shall be mailed to:

City Clerk's Office
City of Auburn Hills
1827 North Squirrel Road
Auburn Hills, MI 48326

A. Insurance Required for the CONTRACTOR

- i. Workers' Compensation and Employers' Liability Comprehensive General Liability, including:
 - a. All premises and operations.
 - b. Explosion, collapse, and underground damage.
 - c. Contractors' Protective.
 - d. Contractual Liability for obligations assumed in the Indemnification-Hold Harmless agreement of this contract.
 - e. Personal Injury Liability.
 - f. Products and Completed Operations.
- ii. Comprehensive Automobile Liability, including owned, non-owned, and hired vehicles.
- iii. Umbrella or Excess Liability.

B. Insurance Required for the OWNER

Owners' Protective Liability which endorses as insured(s) the OWNER; the ENGINEER, Orchard, Hiltz & McCliment, Inc.; their consultants, agents, employees and such public corporations in whose jurisdiction the work is located.

C. Insurance Required for the CONTRACTOR and the OWNER

Builders Risk-Installation Floater which endorses as insured(s) the OWNER; the ENGINEER, Orchard, Hiltz & McCliment, Inc.; their consultants, agents and employees; the CONTRACTOR and all subcontractors.

2.3.3. Qualification of Insurers

In order to determine the financial strength and reputation of insurance carriers, all companies providing coverages required shall be licensed or approved by the Office of Financial and Insurance Services of the State of Michigan. The company shall also have a financial rating not lower than X and a policyholder's service rating no lower than A as listed in A.M. Best's Key Rating Guide, current edition. Companies with ratings lower than A:X will be acceptable only upon the written consent of the OWNER

2.3.4. Subcontractor's Insurance Requirements

If approval is granted by the City of Auburn Hills for Contractor to subcontract any or all of this contract to others, then prior to commencing the subcontract, the Contractor shall furnish certificates evidencing the same insurance for the City of Auburn Hills as required in Items 2.1, 2.2, and 2.3.

End of Section

BID FORM

Hillfield, Rex Blvd & Old Adams Water Main
City of Auburn Hills

THIS BID IS SUBMITTED TO:

City of Auburn Hills
1827 North Squirrel Road
Auburn Hills, MI 48326

The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

Bidder accepts all of the terms and conditions of the Advertisement to Bid, Instructions to Bidders and Supplemental Instructions to Bidders.

In submitting this Bid, Bidder represents, as set forth in the Agreement, that:

- A. Bidder has examined and carefully studied the Bidding Documents, the other related data identified in the Bidding Documents, and the following Addenda, receipt of all which is hereby acknowledged.

Addendum No.	Addendum Date	Signature
--------------	---------------	-----------

_____	_____	_____
_____	_____	_____
_____	_____	_____

- B. Bidder has visited the site and become familiar with and is satisfied as to the general, local and Site conditions that may affect cost, progress, and performance of the Work.
- C. Bidder is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress and performance of the Work.
- D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site (except underground facilities) which have been identified in the Supplemental Instructions to Bidders, and (2) reports and drawings of a hazardous environmental condition, if any, which has been identified in the Supplemental Instructions to Bidders.
- E. Bidder has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and underground facilities) at or contiguous to the site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences,

and procedures of construction expressly required by the Bidding Documents to be employed by Bidder, and safety precautions and programs incident thereto.

- F. Bidder does not consider that any further examinations, investigations, exploration, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents.
- G. Bidder is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Bidding Documents.
- H. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.
- I. Bidder has given ENGINEER written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by ENGINEER is acceptable to Bidder.
- J. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

Bidder further represents that this Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any individual or entity to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

BID FORM for
Hillfield, Rex Blvd & Old Adams Water Main
City of Auburn Hills, Oakland County, State of Michigan
OHM Job Number: 0120-20-0400

Item	Description	Estimated Quantity	Unit Price	Amount
<u>Category 1: Hillfield & M59</u>				
1	Mobilization, Max	1.00 LSUM	\$ _____	\$ _____
2	Tree, Rem, 6 inch to 18 inch	7.00 Ea	\$ _____	\$ _____
3	Pavt, Rem	517.00 Syd	\$ _____	\$ _____
4	Embankment, LM	75.00 Cyd	\$ _____	\$ _____
5	Excavation, Earth	10.00 Cyd	\$ _____	\$ _____
6	Subgrade Undercutting, Type II	30.00 Cyd	\$ _____	\$ _____
7	Subgrade Undercutting, Type II (Special)	10.00 Cyd	\$ _____	\$ _____
8	Erosion Control	1.00 LSUM	\$ _____	\$ _____
9	Project Cleanup	1.00 LSUM	\$ _____	\$ _____
10	Aggregate Base, 8 inch	545.00 Syd	\$ _____	\$ _____
11	HMA 5E1, 2 inch	512.00 Syd	\$ _____	\$ _____
12	HMA, 4E1, 2 inch	512.00 Syd	\$ _____	\$ _____
13	Driveway, Nonreinf Conc, 8 inch	34.00 Syd	\$ _____	\$ _____
14	Fence, Remove and Replace	60.00 Ft	\$ _____	\$ _____
15	Traffic Control	1.00 LSUM	\$ _____	\$ _____
16	Turf Establishment, Performance	1161.00 Syd	\$ _____	\$ _____
17	Water Main, Remove	120.00 Ft	\$ _____	\$ _____
18	Water Main, CL 54 D.I., 12 inch	189.00 Ft	\$ _____	\$ _____
19	Water Main, CL 54 D.I., 6 inch	13.00 Ft	\$ _____	\$ _____
20	Water Main, CL 54 D.I., 8 inch	62.00 Ft	\$ _____	\$ _____
21	Water Main, HDPE, DR-11, 14 inch, Directional Drill	585.00 Ft	\$ _____	\$ _____
22	Boring Pit	4.00 Ea	\$ _____	\$ _____
23	Connection to Existing Water Main	2.00 Ea	\$ _____	\$ _____
24	Fire Hydrant	1.00 Ea	\$ _____	\$ _____
25	Gate Valve, 8 inch, Well, 96 inch	2.00 Ea	\$ _____	\$ _____
26	Hydrant, Rem	1.00 Ea	\$ _____	\$ _____
27	PRV, Complete	1.00 LSUM	\$ _____	\$ _____
28	Electrical Allowance (DTE)	1.00 LSUM	\$ _____	\$ _____

BID FORM for
Hillfield, Rex Blvd & Old Adams Water Main
City of Auburn Hills, Oakland County, State of Michigan
OHM Job Number: 0120-20-0400

Item	Description	Estimated Quantity	Unit Price	Amount
29	Electrical, Complete	1.00 LSUM	\$ _____	\$ _____
30	Crew Days	_____ Days	\$ 780.00	\$ _____
	ALTERNATE to Pay Item 25 - Gate Valve and Well, 8 inch	1.00 Ea	\$ _____	\$ _____
	ALTERNATE to Pay Item 25 - Gate Valve, 8 inch, Well, 72 inch	2.00 Ea	\$ _____	\$ _____

Subtotal Category 1 (ITEMS 1-30 incl., excluding Alternates): \$ _____

Category 2: Rex Blvd

31	Mobilization, Max	1.00 LSUM	\$ _____	\$ _____
32	Tree, Rem, 19 inch to 36 inch	1.00 Ea	\$ _____	\$ _____
33	Pavt, Rem	923.00 Syd	\$ _____	\$ _____
34	Subgrade Undercutting, Type II	5.00 Cyd	\$ _____	\$ _____
35	Erosion Control	1.00 LSUM	\$ _____	\$ _____
36	Project Cleanup	1.00 LSUM	\$ _____	\$ _____
37	Aggregate Base, 8 inch	969.00 Syd	\$ _____	\$ _____
38	Maintenance Gravel	10.00 Ton	\$ _____	\$ _____
39	Trench Undercut and Backfill	12.00 Cyd	\$ _____	\$ _____
40	Structure, Reconstruct	24.00 Ft	\$ _____	\$ _____
41	HMA 5E1, 2 inch	689.00 Syd	\$ _____	\$ _____
42	HMA, 4E1, 2 inch	689.00 Syd	\$ _____	\$ _____
43	Driveway, Nonreinf Conc, 8 inch	280.00 Syd	\$ _____	\$ _____
44	Pavt Mrkg, Polyurea, 4 inch, Yellow	1739.00 Ft	\$ _____	\$ _____
45	Traffic Control	1.00 LSUM	\$ _____	\$ _____
46	Turf Establishment, Performance	123.00 Syd	\$ _____	\$ _____
47	Remove Bollard	2.00 Ea	\$ _____	\$ _____
48	Gate Valve and Box, 8 inch	1.00 Ea	\$ _____	\$ _____
49	Gate Well, Rem	1.00 Ea	\$ _____	\$ _____
50	Water Serv	2.00 Ea	\$ _____	\$ _____

BID FORM for
Hillfield, Rex Blvd & Old Adams Water Main
City of Auburn Hills, Oakland County, State of Michigan
OHM Job Number: 0120-20-0400

Item	Description	Estimated Quantity	Unit Price	Amount
51	Water Main, Remove	20.00 Ft	\$ _____	\$ _____
52	Water Main, C900, 8 inch, Open Cut	472.00 Ft	\$ _____	\$ _____
53	Water Main, CL 54 D.I., 6 inch	37.00 Ft	\$ _____	\$ _____
54	Water Main, CL 54 D.I., 8 inch	20.00 Ft	\$ _____	\$ _____
55	Connection to Existing Water Main	2.00 Ea	\$ _____	\$ _____
56	Fire Hydrant	2.00 Ea	\$ _____	\$ _____
57	Gate Valve and Well, 8 inch	1.00 Ea	\$ _____	\$ _____
58	Hydrant, Rem	2.00 Ea	\$ _____	\$ _____
59	Water Main, Pressure Grout	1.00 LSUM	\$ _____	\$ _____
60	Irrigation Repair	1.00 LSUM	\$ _____	\$ _____
61	Crew Days	_____ Days	\$ 780.00	\$ _____

Subtotal Category 2 (ITEMS 31-61 incl.): \$ _____

Category 3: Old Adams

62	Mobilization, Max	1.00 LSUM	\$ _____	\$ _____
63	Curb and Gutter, Rem	23.00 Ft	\$ _____	\$ _____
64	Pavt, Rem	325.00 Syd	\$ _____	\$ _____
65	Sidewalk, Rem	3.00 Syd	\$ _____	\$ _____
66	Subgrade Undercutting, Type II	5.00 Cyd	\$ _____	\$ _____
67	Erosion Control	1.00 LSUM	\$ _____	\$ _____
68	Project Cleanup	1.00 LSUM	\$ _____	\$ _____
69	Aggregate Base, 4 inch	319.00 Syd	\$ _____	\$ _____
70	Aggregate Base, 8 inch	35.00 Syd	\$ _____	\$ _____
71	Adjust Drainage Structure	1.00 Ea	\$ _____	\$ _____
72	HMA, 5E1	3.00 Ton	\$ _____	\$ _____
73	Curb and Gutter, Conc, Det F2	23.00 Ft	\$ _____	\$ _____
74	Detectable Warning Surface	8.00 Ft	\$ _____	\$ _____
75	Sidewalk Ramp, Conc, 6 inch	145.00 Sft	\$ _____	\$ _____

BID FORM for
Hillfield, Rex Blvd & Old Adams Water Main
City of Auburn Hills, Oakland County, State of Michigan
OHM Job Number: 0120-20-0400

Item	Description	Estimated Quantity	Unit Price	Amount
76	Shared use Path, Grading	300.00 Ft	\$ _____	\$ _____
77	Shared use Path, HMA	53.00 Ton	\$ _____	\$ _____
78	Traffic Control	1.00 LSUM	\$ _____	\$ _____
79	Turf Establishment, Performance	428.00 Syd	\$ _____	\$ _____
80	Water Main, Remove	20.00 Ft	\$ _____	\$ _____
81	Water Main, CL 54 D.I., 6 inch	6.00 Ft	\$ _____	\$ _____
82	Water Main, CL 54 D.I., 8 inch	329.00 Ft	\$ _____	\$ _____
83	Fire Hydrant	1.00 Ea	\$ _____	\$ _____
84	Gate Valve and Well, 8 inch	1.00 Ea	\$ _____	\$ _____
85	Irrigation Repair	1.00 LSUM	\$ _____	\$ _____
86	Crew Days	_____ Days	\$ 780.00	\$ _____

Subtotal Category 3 (ITEMS 62-86 incl.): \$ _____

Subtotal Category 1: \$ _____

Subtotal Category 2: \$ _____

Subtotal Category 3: \$ _____

Total Bid Amount (Categories 1-3 incl.; excluding Alternates): \$ _____

Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all unit price bid items will be based on actual quantities constructed in accordance with the Contract Documents.

Bidder agrees that the Work will be Substantially Complete on or before October 1, 2021, and completed and ready for final payment in accordance with the General Conditions on or before October 15, 2021.

Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the times specified above, which shall be stated in the Agreement.

The following documents are attached to and made a condition of this Bid:

- Bid Guarantee (circle one): Cashier's Check or Bid Bond
- Statement of Qualifications
- Subcontractor Listing
- Legal Status of Bidder

SUBMITTED on _____, 20 _____

State Contractor License No. _____ . (If applicable)

If Bidder is:

An Individual

Name (typed or printed): _____

By: _____ (SEAL)
(Individual's signature)

Doing business as: _____

Business address: _____

Phone No.: _____ FAX No.: _____

A Partnership

Partnership Name: _____ (SEAL)

By: _____
(Signature of general partner – attach evidence of authority to sign)

Name (typed or printed): _____

Business address: _____

Phone No.: _____ FAX No.: _____

A Corporation

Corporation Name: _____ (SEAL)

State of Incorporation: _____

Type (General Business, Professional, Service, Limited Liability): _____

By: _____
(Signature – attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Attest: _____ (CORPORATE SEAL)
(Signature of Corporate Secretary)

Business address: _____

Phone No.: _____ FAX No.: _____

Date of Qualification to do business is: _____

A Joint Venture

Joint Venture Name: _____ (SEAL)

By: _____
(Signature of joint venture partner – attach evidence of authority to sign)

Name (typed or printed): _____

Title:

Business address: _____

Phone No.: _____ FAX No.: _____

Joint Venture Name: _____ (SEAL)

By: _____
(Signature of joint venture partner – attach evidence of authority to sign)

Name (typed or printed): _____

Title:

Business address: _____

Phone No.: _____ FAX No.: _____

Phone and FAX Number, and Address for receipt of official communications.

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above).

BID GUARANTEE

The undersigned attaches bid security in the form of a BID BOND / CERTIFIED CHECK / CASHIER'S CHECK (Circle one) in the amount of _____

Dollars (\$_____).

The undersigned agrees, if awarded the Contract, to deliver the executed Agreement and bonds and furnish evidence of insurance within fourteen (14) business days after the date of the Notice of Award. And to complete the proposed work within the time specified in the Bid Form.

If the Bid is accepted by the OWNER, and the undersigned shall fail to enter into the Agreement as aforesaid and to furnish the required surety bonds within fourteen (14) business days after Notice of Award, the Bid Bond in the amount of \$_____ accompanying this Bid shall be considered due and payable to the OWNER.

If the undersigned enters into the Agreement in accordance with this Bid or if his Bid is rejected, then the accompanying Bid Guarantee shall be voided.

In submitting this Bid, it is understood that the right is reserved by the OWNER to reject any or all bids, to waive irregularities and/or formalities and, in general, to make award in any manner deemed by it, in its sole discretion, to be in the best interest of the OWNER.

SIGNED AND SEALED THIS _____ DAY OF _____, 20 _____

Authorized Signature of Bidder:

(TITLE) _____

(SEAL)

BID BOND

BIDDER (Name and Address):

SURETY (Name and Address of Principal Place of Business):

OWNER (Name and Address):

City of Auburn Hills

1827 North Squirrel Road

Auburn Hills, MI 48326

BID

BID DUE DATE: May 26, 2021

PROJECT (Brief Description Including Location):

Water main connection between Executive Hills Blvd and Hillfield Road, crossing M-59. Replacement of water main on Rex Blvd and extension of water main along Old Adams Road.

BOND

BOND NUMBER: _____

DATE (Not later than Bid due date): _____

PENAL SUM: _____
(Words) (Figures)

IN WITNESS WHEREOF, Surety and Bidder, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

BIDDER

(Seal)

Bidder's Name and Corporate Seal

By: _____
Signature and Title

Attest: _____
Signature and Title

SURETY

(Seal)

Surety's Name and Corporate Seal

By: _____
Signature and Title
(Attach Power of Attorney)

Attest: _____
Signature and Title

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to OWNER upon default of Bidder the penal sum set forth on the face of this Bond.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by OWNER) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Document.
3. This obligation shall be null and void if:
 - 3.1. OWNER accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by OWNER) the executed Agreement required by the Bidding Documents and any performance and payment Bonds required by the Bidding Documents, or
 - 3.2. All Bids are rejected by OWNER, or
 - 3.3. OWNER fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default by Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from OWNER, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of and any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by OWNER and Bidder, provided that the total time of issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent or representative who executed this Bond on behalf of Surety to execute, seal and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer or proposal as applicable.

End of Section

STATEMENT OF QUALIFICATIONS

Bidder must answer all questions. If more space is needed to complete a question, attach a separate sheet. Bidder may submit any additional information.

Name: _____

Address: _____ Phone: _____

Number of years operating under your present name: _____

Bonding Capacity: _____

Bonding Company: _____ Phone: _____

Prequalified by MDOT to bid on projects of this magnitude and type of work

(circle one) YES NO Prequalification Number: _____

General nature of work performed by your company: _____

Background and experience of the principal members of your organization including officers:

Major equipment available for this contract: _____

CURRENT PROJECTS:

	Project	Project	Project
Name:	<hr/>	<hr/>	<hr/>
Owner:	<hr/>	<hr/>	<hr/>
Contact Person:	<hr/>	<hr/>	<hr/>
Phone:	<hr/>	<hr/>	<hr/>
Contract Amount:	<hr/>	<hr/>	<hr/>
Completion Date:	<hr/>	<hr/>	<hr/>
% Complete:	<hr/>	<hr/>	<hr/>

COMPLETED PROJECTS:

	Project	Project	Project
Name:	<hr/>	<hr/>	<hr/>
Owner:	<hr/>	<hr/>	<hr/>
Contact Person:	<hr/>	<hr/>	<hr/>
Phone:	<hr/>	<hr/>	<hr/>
Contract Amount:	<hr/>	<hr/>	<hr/>
Date Completed:	<hr/>	<hr/>	<hr/>

Additional information that may be pertinent to demonstrate your ability to complete this project.

Has your company defaulted on a contract? _____

If yes, where and why? _____

I hereby certify that the above answers are correct and true.

By: _____
Name

Signature

Title

Number of additional sheets attached: _____

IRAN LINKED BUSINESS CERTIFICATION

Pursuant to Michigan Public Act 517 of 2012, any Bidder that submits a bid on a request for proposal with City of Auburn Hills shall certify that Bidder is not an Iran linked business. An Iran linked business is not eligible to submit a bid on a request for proposal with City of Auburn Hills. See attached definitions regarding this certification.

The undersigned Bidder does hereby certify, pursuant to Michigan Public Act 517 of 2012, that:

Bidder is not a person engaging in investment activities in the energy sector of Iran, including a person that provides oil or liquefied natural gas tankers, or products used to construct or maintain pipelines used to transport oil or liquefied natural gas, for the energy sector of Iran, or

Bidder is not a financial institution that extends credit to another person if that person will use the credit to engage in investment activities in the energy sector of Iran.

Date: _____

By: _____

Its: _____

Subscribed and sworn to before me, a Notary Public on this _____ day of _____,--.

Notary Public _____

_____ County, Michigan

My Commission Expires: _____

DEFINITIONS

- (A) “Energy sector of Iran” means activities to develop petroleum or natural gas resources or nuclear power in Iran.
- (B) “Investment” means 1 or more of the following:
 - i. A commitment or contribution of funds or property.
 - ii. A loan or other extension of credit.
 - iii. The entry into or renewal of a contract for goods or services.
- (C) “Investment activity” means 1 or more of the following:
 - i. A person who has an investment of \$20,000,000.00 or more in the energy sector of Iran.
 - ii. A financial institution that exceeds \$20,000,000.00 or more in credit to another person, for 45 days or more, if that person will use the credit for investment in the energy sector of Iran.
- (D) “Iran” means any agency or instrumentality of Iran.
- (E) “Iran linked business” means either of the following:
 - i. A person engaging in investment activities in the energy sector of Iran, including a person that provides oil or liquefied natural gas tankers or products used to construct or maintain pipelines used to transport oil or liquefied natural gas for the energy sector of Iran.
 - ii. A financial institution that extends credit to another person, if that person will use the credit to engage in investment activities in the energy sector of Iran.
- (F) “Person” means any of the following:
 - i. An individual, corporation, company, limited liability company, business association, partnership, society, trust, or any other nongovernmental entity, organization, or group.
 - ii. Any governmental entity or instrumentality of a government, including a multilateral development institution, as defined in section 1701(c) (3) of the international financial institutional act, 22 USC 262r(c) (3).
 - iii. Any successor, subunit, parent company, or subsidiary of, or company under common ownership or control with, any entity described in subparagraph (i) or (ii).
- (G) “Public entity” means this state or an agency or authority of this state, school district, community college district, intermediate school district, city, village, township, county, public authority, or public airport authority.

VALUE ADDED OPTIONS

The *City of Auburn Hills* seeks to derive the greatest benefit from the purchases that it makes in order to deliver the highest level of services in a most cost effective method to its residential and corporate citizens. In determining the lowest qualified bidder, the City will evaluate any additional VALUE ADDED items that a vendor may offer, either at low or no additional cost. Examples of these items include but are not limited to:

- training
- extended warranty
- early payment discounts
- quantity discounts
- holding the bid price for an extended period of time

Please be certain to clearly identify these items when submitting your quotes and/or bids to the City. VALUE ADDED items will not be accepted after the final date and time for the opening of quotes and/or bids has occurred. Use the space below to indicate any VALUE ADDED items, if any, to your proposal. Attach additional sheets if necessary.

SUBCONTRACTOR LISTING

Bidder submits to use the following subcontractors for performance of the work in accordance with Article 9 of the Instructions to Bidders.

Note to Bidder: List all work you propose to sublet on this Contract. Include each subcontractors name, address, phone, fax and e-mail address. Also include a description of work to be performed by subcontractor. For example: restoration, landscaping, lighting, signage, bore and jack, etc. List approximate dollar value of the subcontract.

NAME, ADDRESS & PHONE NO. OF SUBCONTRACTOR	DESCRIPTION OF WORK	APPROXIMATE DOLLAR VALUE OF SUBCONTRACT
---	------------------------	---

_____	_____	\$ _____
-------	-------	----------

Phone: _____

FAX: _____

E-mail _____

_____	_____	\$ _____
-------	-------	----------

Phone: _____

FAX: _____

E-mail _____

_____ \$ _____

Phone: _____

FAX: _____

E-mail _____

_____ \$ _____

Phone: _____

FAX: _____

E-mail _____

_____ \$ _____

Phone: _____

FAX: _____

E-mail _____

AGREEMENT

This AGREEMENT is by and between City of Auburn Hills (hereinafter called OWNER) and _____ (hereinafter called CONTRACTOR).

ARTICLE 1 WORK

1.01 CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

Water main connection between Executive Hills Blvd and Hillfield Road, crossing M-59. Replacement of water main on Rex Blvd and extension of water main along Old Adams Road.

ARTICLE 2 THE PROJECT

2.01 The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:

Hillfield, Rex Blvd & Old Adams Water Main

ARTICLE 3 ENGINEER

3.01 The Project has been designed by Orchard Hiltz & McCliment, Inc. who is hereinafter called ENGINEER and who is to act as OWNER's representative, assume all duties and responsibilities, and have the rights and authority assigned to ENGINEER in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 CONTRACT TIMES

4.01 Time is of the Essence

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 Dates for Substantial Completion and Final Payment

A. The Work will be substantially completed on or before October 1, 2021, and completed and ready for final payment on or before October 15, 2021.

4.03 Liquidated Damages

A. CONTRACTOR and OWNER recognize that time is of the essence of this Agreement and that OWNER will suffer financial loss if the Work is not completed within the times specified in paragraph 4.02 above, plus any extensions thereof allowed in accordance with Article 15 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by OWNER if the Work is not completed on time. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty), CONTRACTOR shall pay OWNER \$750.00/day for each day that expires after the time specified in paragraph 4.02 for Substantial Completion until the Work is substantially complete. After Substantial Completion, if CONTRACTOR shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by OWNER, CONTRACTOR shall pay OWNER \$750.00/day for each day that expires after the time specified in paragraph 4.02 for completion and readiness for final payment until the Work is completed and ready for final payment.

ARTICLE 5 CONTRACT PRICE

5.01 OWNER shall pay CONTRACTOR for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to paragraph 5.01.A below:

- A. For all Unit Price Work, an amount equal to the sum of the established unit price for each separately identified item of Unit Price Work multiplied by the measured quantity of that item as indicated in the Bid Form (Bid Form to be inserted here at the time the Agreement is to be signed.):

As provided in Article 13 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by ENGINEER as provided in Article 23 of the General Conditions.

ARTICLE 6 PAYMENT PROCEDURES

6.01 Submittal and Processing of Payments

CONTRACTOR shall be paid in accordance with Article 14 of the General Conditions.

ARTICLE 7 CONTRACTOR'S REPRESENTATIONS

7.01 In order to induce OWNER to enter into this Agreement CONTRACTOR makes the following representations:

CONTRACTOR has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.

CONTRACTOR has visited the site and become familiar with and is satisfied as to the general, local and site conditions that may affect cost, progress, and performance of the Work.

CONTRACTOR is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

CONTRACTOR has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site (except underground facilities) which have been identified in the Supplemental Instructions to Bidders and (2) reports and drawings of a hazardous environmental condition, if any, at the site which has been identified in the Supplemental Instructions to Bidders.

CONTRACTOR has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and underground facilities) at or contiguous to the site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR, including applying the specific means, methods, techniques, sequences, and procedures of construction, if any, expressly required by the Contract Documents to be employed by CONTRACTOR, and safety precautions and programs incident thereto.

CONTRACTOR does not consider that any further examinations, investigations, exploration, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.

CONTRACTOR is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Contract Documents.

CONTRACTOR has correlated the information known to CONTRACTOR, information and observations obtained from visits to the site, reports and drawings identified in the Contract Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.

CONTRACTOR has given ENGINEER written notice of all conflicts, errors, ambiguities, or discrepancies that CONTRACTOR has discovered in the Contract Documents, and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR.

The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

ARTICLE 8 CONTRACT DOCUMENTS

8.01 Contents

A. The Contract Documents consist of the following:

1. This Agreement;
2. Performance Bond;
3. Payment Bond;
4. Maintenance and Guarantee Bond;
5. General Conditions;
6. General Specifications;
7. Technical Specifications as listed in the table of contents of the Project Manual;
8. Appendices (excluding geotechnical reports);
9. Drawings consisting of a cover sheet and sheets numbered 1 through 22, inclusive, with each sheet (excluding standard details) bearing the following general title: Hillfield, Rex Blvd & Old Adams Water Main;
10. Addenda (numbers _____ to _____, inclusive);
11. Exhibits to the Agreement (enumerated as follows):
 - a. Documentation submitted by CONTRACTOR prior to Notice of Award (pages ____ to ____, inclusive);
 - b. _____
12. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
 - a. Written Amendments;
 - b. Work Orders;
 - c. Change Order(s).

The documents listed in paragraph 8.01.A are attached to this Agreement (except as expressly noted otherwise above).

There are no Contract Documents other than those listed above in this Article 8.

ARTICLE 9 MISCELLANEOUS

9.01 Terms

Terms used in this Agreement will have the meanings indicated in the General Conditions.

9.02 Assignment of Agreement

No assignment by a party hereto of any rights under or interests in the Agreement will be binding on another party hereto without the written consent of the party sought to be bound; and,

specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

9.03 Successors and Assigns

OWNER and CONTRACTOR each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

9.04 Severability

Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon OWNER and CONTRACTOR, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

IN WITNESS WHEREOF, OWNER and CONTRACTOR have signed this Agreement in duplicate. One counterpart each has been delivered to OWNER and CONTRACTOR. All portions of the Contract Documents have been signed or identified by OWNER and CONTRACTOR or on their behalf.

This Agreement will be effective on _____ , _____
(which is the Effective Date of the Agreement)

OWNER:

CONTRACTOR:

By: _____
(CORPORATE SEAL)

By: _____
(CORPORATE SEAL)

Attest _____

Attest _____

Address for giving notices: _____

Address for giving notices: _____

(If OWNER is a corporation, attach evidence of authority to sign. If OWNER is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of OWNER – CONTRACTOR Agreement)

License No. _____

(Where applicable)

Agent for service of process: _____

(If CONTRACTOR is a corporation or a partnership, attach evidence of authority to sign.)

Designated Representative:

Designated Representative:

Name: _____

Name: _____

Title: _____

Title: _____

Address: _____

Address: _____

Phone: _____

Phone: _____

FAX: _____

FAX: _____

PERFORMANCE BOND

Any singular reference to CONTRACTOR, Surety, OWNER or other party shall be considered plural where applicable.

CONTRACTOR (Name and Address):

SURETY (Name and Address of Principal
Place of Business): _____

OWNER:

City of Auburn Hills
1827 North Squirrel Road
Auburn Hills, MI 48326

CONTRACT

Date:

Amount:

Description: Hillfield, Rex Blvd & Old Adams Water Main
City of Auburn Hills

BOND

Date (Not earlier than Contract Date):

Amount:

Modifications to this Bond Form:

Surety and CONTRACTOR, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Performance Bond to be duly executed on its behalf by its authorized officer, agent or representative.

CONTRACTOR AS PRINCIPAL

SURETY

Company: _____ (Corp. Seal) Company: _____ (Corp. Seal)

Signature: _____ Signature: _____

Name & Title: _____ Name & Title: _____
(Attach Power of Attorney)

(Space is provided below for signatures of additional parties, if required).

CONTRACTOR AS PRINCIPAL

SURETY

Company: _____ (Corp. Seal) Company: _____ (Corp. Seal)

Signature: _____ Signature: _____

Name & Title: _____ Name & Title: _____
(Attach Power of Attorney)

1. The CONTRACTOR and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the OWNER for the performance of the Contract, which is incorporated herein by reference.
2. If the CONTRACTOR performs the Contract, the Surety and the CONTRACTOR have no obligation under this Bond, except to participate in conferences as provided in paragraph 3.1
3. If there is no OWNER Default, the Surety's obligation under this Bond shall arise after:
 - 3.1. The OWNER has notified the CONTRACTOR and the Surety at the addresses described in paragraph 10 below, that the OWNER is considering declaring a CONTRACTOR Default and has requested and attempted to arrange a conference with the CONTRACTOR and the Surety to be held not later than fifteen days after receipt of such notice to discuss methods of performing the Contract. If the OWNER, the CONTRACTOR and the Surety agree, the CONTRACTOR shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive the OWNER's right, if any, subsequently to declare a CONTRACTOR Default; and
 - 3.2. The OWNER has declared a CONTRACTOR Default and formally terminated the CONTRACTOR's right to complete the Contract. Such CONTRACTOR Default shall not be declared earlier than twenty days after the CONTRACTOR and the Surety have received notice as provided in paragraph 3.1; and
 - 3.3. The OWNER has agreed to pay the Balance of the Contract Price to:
 - 3.3.1. The Surety in accordance with the terms of the Contract;
 - 3.3.2. Another contractor selected pursuant to paragraph 4.3 to perform the Contract.
4. When the OWNER has satisfied the conditions of paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:
 - 4.1. Arrange for the CONTRACTOR, with consent of the OWNER, to perform and complete the Contract; or
 - 4.2. Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
 - 4.3. Obtain bids or negotiated proposals from qualified contractors acceptable to the OWNER for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by the OWNER and the contractor selected with the OWNER's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the Bonds issued on the Contract, and pay to the OWNER the amount of damages as described in paragraph 6 in excess of the Balance of the Contract Price incurred by the OWNER resulting from the CONTRACTOR Default; or
 - 4.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances;
 - 4.4.1. After investigation, determine the amount for which it may be liable to the OWNER and, as soon as practicable after the amount is determined, tender payment therefore to the OWNER; or

4.4.2. Deny liability in whole or in part and notify the OWNER citing reasons therefore.

5. If the Surety does not proceed as provided in paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on the Bond fifteen days after receipt of an additional written notice from the OWNER to the Surety demanding that the Surety perform its obligations under this Bond, and the OWNER shall be entitled to enforce any remedy available to the OWNER. If the Surety proceeds as provided in paragraph 4.4, and the OWNER refuses the payment tendered or the Surety has denied liability, in whole or in part, without further notice the OWNER shall be entitled to enforce any remedy available to the OWNER.
6. After the OWNER has terminated the CONTRACTOR's right to complete the Contract, and if the Surety elects to act under paragraph 4.1, 4.2, or 4.3 above, then the responsibilities of the Surety to the OWNER shall not be greater than those of the CONTRACTOR under the Contract, and the responsibilities of the OWNER to the Surety shall not be greater than those of the OWNER under the Contract. To a limit of the amount of this Bond, but subject to commitment by the OWNER of the Balance of the Contract Price to mitigation of costs and damages on the Contract, the Surety is obligated without duplication for:
 - 6.1. The responsibilities of the CONTRACTOR for correction of defective Work and completion of the Contract;
 - 6.2. Additional legal, design professional and delay costs resulting from the CONTRACTOR's Default, and resulting from the actions or failure to act of the Surety under paragraph 4; and
 - 6.3. Liquidated damages, or if no liquidated damages are specified in

the Contract, actual damages caused by delayed performance or non-performance of the CONTRACTOR.

7. The Surety shall not be liable to the OWNER or others for obligations of the CONTRACTOR that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on the bond to any person or entity other than the OWNER or its heirs, executors, administrators, or successors.
8. The Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders and other obligations.
9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located and shall be instituted within two years after CONTRACTOR Default or within two years after the CONTRACTOR ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
10. Notice to the Surety, the OWNER or the CONTRACTOR shall be mailed or delivered to the address shown on the signature page.
11. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the Contract was being performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted here from and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a

statutory bond and not as a common law bond.

12. Definitions.

- 12.1. Balance of the Contract Price:
The total amount payable by the OWNER to the CONTRACTOR under the Contract after all proper adjustments have been made, including allowance to the CONTRACTOR or any amounts received or to be received by the OWNER in settlement of insurance or other Claims for damages to which the CONTRACTOR is entitled, reduced by all valid and proper payments made to or on behalf of the CONTRACTOR under the Contract.

- 12.2. Contract: the agreement between the OWNER and the CONTRACTOR identified on the signature page, including all Contract Documents and changes thereto.

- 12.3. CONTRACTOR Default: Failure of the CONTRACTOR, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.

- 12.4. OWNER Default: Failure of the OWNER, which has neither been remedied nor waived, to pay the CONTRACTOR as required by the contract or to perform and complete or comply with the other terms thereof.

End of Section

PAYMENT BOND

Any singular reference to CONTRACTOR, Surety, OWNER or other party shall be considered plural where applicable.

CONTRACTOR (Name and Address):

SURETY (Name and Address of Principal Place of Business): _____

OWNER:

City of Auburn Hills
1827 North Squirrel Road
Auburn Hills, MI 48326

CONTRACT

Date:

Amount:

Description: Hillfield, Rex Blvd & Old Adams Water Main
City of Auburn Hills

BOND

Date (Not earlier than Contract Date):

Amount:

Modifications to this Bond Form:

Surety and CONTRACTOR, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Payment bond to be duly executed on its behalf by its authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

Company: _____ (Corp. Seal) Company: _____ (Corp. Seal)

Signature: _____ Signature: _____

Name and Title: _____ Name and Title: _____
(Attach Power of Attorney)

(Space is provided below for signatures of additional parties, if required).

CONTRACTOR AS PRINCIPAL

SURETY

Company: _____ (Corp. Seal) Company: _____ (Corp. Seal)

Signature: _____ Signature: _____

Name & Title: _____ Name & Title: _____
(Attach Power of Attorney)

1. The CONTRACTOR and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the OWNER to pay for labor, materials and equipment furnished for use in the performance of the Contract, which is incorporated herein by reference.
2. With respect to the OWNER, this obligation shall be null and void if the CONTRACTOR:
 - 2.1. Promptly makes payment, directly or indirectly, for all sums due Claimants, and
 - 2.2. Defends, indemnifies and holds harmless the OWNER from all claims, demands, liens or suits by any person or entity who furnished labor, materials or equipment for use in the performance of the Contract, provided the OWNER has promptly notified the CONTRACTOR and the Surety (at the addresses described in paragraph 12) of any claims, demands, liens or suits and tendered defense of such claims, demands, liens or suits to the CONTRACTOR and the Surety, and provided there is no OWNER Default.
3. With respect to Claimants, this obligation shall be null and void if the CONTRACTOR promptly makes payment, directly or indirectly, for all sums due.
4. The Surety shall have no obligation to Claimants under this Bond until:
 - 4.1. Claimants who are employed by or have a direct contract with the CONTRACTOR have given notice to the surety (at the addresses described in paragraph 12) and sent a copy, or notice thereof, to the OWNER, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
 - 4.2. Claimants who do not have a direct contract with the CONTRACTOR:
 - 4.2.1. Have furnished written notice to the CONTRACTOR and sent a copy, or notice thereof, to the OWNER, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials were furnished or supplied or for whom the labor was done or performed; and
 - 4.2.2. Have either received a rejection in whole or in part from the CONTRACTOR, or not received within 30 days of furnishing the above notice any communication from the CONTRACTOR by which the CONTRACTOR had indicated the claim will be paid directly or indirectly; and
 - 4.2.3. Not having been paid within the above 30 days, have sent a written notice to the Surety and sent a copy, or notice thereof, to the OWNER, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to the CONTRACTOR.
5. If a notice required by paragraph 4 is given by the OWNER to the CONTRACTOR or to the Surety, that is sufficient compliance.
6. When the Claimant has satisfied the conditions of paragraph 4, the Surety shall promptly and at the Surety's expense take the following actions:
 - 6.1. Send an answer to the Claimant, with a copy to the OWNER, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.
 - 6.2. Pay or arrange for payment of any undisputed amounts.
7. The Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.
8. Amounts owed by the OWNER to the CONTRACTOR under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any Performance Bond. By the CONTRACTOR

furnishing and the OWNER accepting this Bond, they agree that all funds earned by the CONTRACTOR in the performance of the Contract are dedicated to satisfy obligations of the CONTRACTOR and the Surety under this Bond, subject to the OWNER's priority to use the funds for the completion of the Work.

9. The Surety shall not be liable to the OWNER, Claimants or others for obligations of the CONTRACTOR that are unrelated to the Contract. The OWNER shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.
10. The Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders and other obligations.
11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by paragraph 4.1 or paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
12. Notice to the Surety, the OWNER or the CONTRACTOR shall be mailed or delivered to the addressee shown on the signature page. Actual receipt of notice by Surety, the OWNER or the CONTRACTOR, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.
13. When this Bond has been furnished to comply with a statutory or other legal requirement in

the location where the Contract was to be performed, any provision in the Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is, that this Bond shall be construed as a statutory Bond and not as a common law bond.

14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, the CONTRACTOR shall promptly furnish a copy of the Bond or shall permit a copy to be made.

15. DEFINITIONS

- 15.1. Claimant: an individual or entity having a direct contract with the CONTRACTOR or with a Subcontractor of the CONTRACTOR to furnish labor, material or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of the CONTRACTOR and the CONTRACTOR's Subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.
- 15.2. Contract: The agreement between the OWNER and the CONTRACTOR identified on the signature page, including all Contract Documents and changes thereto.
- 15.3. OWNER Default: Failure of the OWNER, which has neither been remedied nor waived, to pay the CONTRACTOR as required by the Contract or to perform and complete or comply with the other terms thereof.

End of Section

MAINTENANCE AND GUARANTEE BOND

KNOW ALL MEN BY THESE PRESENTS, That we _____ (contractor name), as Principal, and _____, as Surety, are held and firmly bound unto the City of Auburn Hills, 1827 North Squirrel Road, Auburn Hills, MI 48326, as Owner, in the sum of _____ DOLLARS and _____ CENTS (\$ _____) good and lawful money of the United States of America, to be paid to said City of Auburn Hills, its legal representatives and assigns for which payment well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, and each and every one of them jointly and severally, firmly by these presents.

Sealed with our seals and dated this _____ day of _____ A.D. 20 _____.

WHEREAS, the above named Principal has entered into a certain written Contract with City of Auburn Hills dated this _____ day of _____ A.D. 20 _____, wherein the said Principal covenanted and agreed to follows, to-wit: TO CONSTRUCT THE WORK IN ACCORDANCE WITH THE SPECIFICATIONS, CONTRACT DOCUMENTS AND DRAWINGS TITLED: Hillfield, Rex Blvd & Old Adams Water Main, OHM JOB NO. 0120-20-0400.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that by and under said Contract, the above named Principal has agreed with the City of Auburn Hills that for a period of TWO year(s) from date of payment of Final Estimate, to keep in good order and repair any defect in all work done under said Contract either by the Principal or his Subcontractors, or his material suppliers, that may develop during said period due to improper materials, defective equipment, workmanship or arrangements, and any other work affected in making good such imperfections, shall also be made good all without expense to the OWNER, excepting only such parts or part of said work as may have been disturbed without consent or approval of the Principal after final acceptance of the work, and that whenever directed to do so by the OWNER by notice served in writing, either personally or by mail, on the Principal at _____ (contractor's city, state, and zip code),

_____, legal representatives, or successors, or on the Surety at _____ WILL PROCEED at once to make such repairs as directed by said OWNER; and in case of failure so to do within one week from the date of service of such notice, or within reasonable time not less than one week, as shall be fixed in said notice, then the said OWNER shall have the right to purchase such materials and employ such labor and equipment as may be necessary for the purpose, and to undertake, do and make such repairs and charge the expense thereof to, and receive same from, said Principal or Surety. If any repair is necessary to be made at once to protect life and property, then and in that case, the said OWNER may take immediate steps to repair or barricade such defects without notice to the CONTRACTOR. In such accounting the said OWNER shall not be held to obtain the lowest figures for the doing of the work, or any part thereof, but all sums actually paid therefore shall be charged to the Principal or Surety. In this connection the judgment of the OWNER is final and conclusive. If the said Principal for a period of TWO year(s) from the date of payment of Final Estimate, shall keep said work so constructed under said Contract in good order and repair, excepting only such part or parts of said work which may have been disturbed without the consent or approval of said Principal after final acceptance of same, and shall whenever notice is given as hereinbefore specified, at once proceed to make repair as in said notice directed, or shall reimburse said OWNER for any expense incurred by making such repairs, should the Principal or Surety fail to do as hereinbefore specified, and shall fully indemnify, defend and save harmless the said Owner and Orchard, Hiltz & McCliment, Inc. from all suits and actions for damages of every name and description brought or claimed against it for, or on account of, any injury or damage to person or property received or sustained by any party or parties, by or from any of the acts or omissions or through the negligence of said

Principal, servants, agents or employees, in the prosecution of the work included in said Contract, and from any and all claims arising under the Workman's Compensation Act, so-called, of the State of Michigan, then the above obligation shall be void, otherwise to remain in full force and effect.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed by their respective authorized officers this _____ day of _____ A.D., 20 _____.

Signed, Sealed and Delivered
In the Presence of:

Signature

Signature

Name

Name

Principal

Signature

Signature

Name

Name

Surety

CONTRACTOR'S AFFIDAVIT

STATE OF MICHIGAN)
)SS.

COUNTY OF _____)

The undersigned, _____, CONTRACTOR, hereby represents that on _____, 20____ he (it) was awarded a Contract by City of Auburn Hills hereinafter called the OWNER, to construct Hillfield, Rex Blvd & Old Adams Water Main in accordance with the terms and conditions of Contract No. _____; and the undersigned further represents that the subject work has now been accomplished and the said Contract has now been completed.

The undersigned hereby warrants and certifies that all of his (its) indebtedness arising by reason of said Contract has been fully or satisfactorily secured, and that all claims from subcontractors and others for labor and material used in accomplishing the said project, as well as all other claims arising from performance of said Contract, have been fully paid or satisfactorily secured. The undersigned further agrees that if any such claim should hereafter arise, he (it) shall assume responsibility for same immediately upon request to do so by the OWNER.

The undersigned, for a valuable consideration, receipt of which is hereby acknowledged, does further hereby waive, release and relinquish any and all claims or right of lien which the undersigned now has or may hereafter acquire upon the subject premises for labor and material used in accomplishing said project owned by the OWNER.

This affidavit is freely and voluntarily given with full knowledge of the facts on this _____ day of _____, 20____.

Contractor

By: _____

Title _____

Subscribed and sworn to before me, a Notary
Public in and for _____
County, Michigan, on this _____ day of
_____, 20____.

Notary Public: _____

My Commission expires: _____

CONTRACTOR'S DECLARATION

I HEREBY DECLARE THAT I HAVE NOT, during the period

_____ to

_____ A.D., 20 _____ performed any work, furnished any material, sustained any loss, damage or delay for any reason, including soil conditions encountered or created, or otherwise done anything for which I shall ask, demand, sue for or claim compensation from City of Auburn Hills or his agents, in addition to the regular items set forth in the Contract numbered ____ and dated _____ A.D., 20 _____ for the Agreement executed between myself and the OWNER, and in the Change Orders for work issued by the OWNER in writing as provided thereunder, except as I hereby make claim for additional compensation and/or extension of time, as set forth on the itemized statement attached hereto.

There (is) (is not) an itemized statement attached.

Date: _____

By: _____

Title: _____

SWORN STATEMENT

State of Michigan

County of: _____ Date: _____

_____ (deponent) being duly sworn deposes and says:

1. That _____ is the Contractor/Subcontractor for an improvement to the property described on the following page.
2. That the following is a statement of each subcontractor and supplier and laborer, for which the payment of wages or fringe benefits and withholdings is due but unpaid, with whom the Contractor/Subcontractor has Contracted/Subcontracted for performance under the Contract with the Owner or Lessee of the property, and that the amounts due to the persons as of the date hereof are correctly and fully set forth opposite their names as follows:

Name of Subcontractor, Supplier or Laborer	Type of Improvement Furnished	Total Contract Price	Amount Already Paid	Amount Currently Owing	Amount of Laborer Wages Due but Unpaid	Amount of Labor, Fringe Benefits & Withholdings due but Unpaid

The contracts or subcontracts cited herein are for improvement to the following described real property situated in Oakland County, Michigan, described as:

(Insert legal description of property) _____

Commonly known as:

Hillfield, Rex Blvd & Old Adams Water Main

OHM Job Number:

0120-20-0400

3. That the Contractor has not procured material from, or subcontracted with, any person other than those set forth above and owes no money for the improvement other than the sums set forth above.
4. Deponent further says that he makes the foregoing statement as the Contractor/Subcontractor or as Controller of the Contractor/Subcontractor for the purpose of representing to the owner of the above described premises and his agents that the above described property is free from claims of construction liens, or the possibility of construction liens, except as specifically set forth above and except for claims of construction liens by laborers which may be provided pursuant to Section 109 of the Construction Lien Act, Act No. 497 of the Public Acts of 1980, as amended, being Section 570.1109 of the Michigan Compiled Laws.

WARNING TO OWNER: An Owner of the above described property may not rely on this sworn statement to avoid the claim of a Subcontractor, Supplier or Laborer who has provided a Notice of Furnishing (or a Laborer who may provide a Notice of Furnishing pursuant to Section 109 of the Construction Lien Act) to the Designee or to the Owner if the Designee is not named or has died.

Dated: _____

Signature of Deponent

WARNING TO DEPONENT: A person, who with intent to defraud, gives a false sworn statement is subject to criminal penalties as provided in Section 110 of the Construction Lien Act, Act No. 497 of the Public Acts of 1980, as amended, being Section 570.1110 of the Michigan Compiled Laws.

Subscribed and sworn to before me on: _____ in _____ County, Michigan

My commission expires: _____ Signature: _____

GENERAL CONDITIONS

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General

1. DEFINITIONS

The following terms as used in the Contract Documents are respectively defined as follows:

“Agreement”: The written document between the OWNER and the CONTRACTOR concerning the work to be performed.

“Change Order” - A document recommended by ENGINEER, which is signed by CONTRACTOR and OWNER and authorizes an addition, deletion or revision in the Work, or an adjustment in the Contract Price or the Contract Time, issued on or after the Effective Date of the Agreement.

“Contract” – The entire and integrated written agreement between the OWNER and CONTRACTOR concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

“CONTRACTOR”: The person, firm or corporation to whom the Contract is awarded by the OWNER and who is subject to the terms thereof and party of the second part of the Agreement.

“ENGINEER”: Orchard, Hiltz & McClimment, Inc., Livonia, Michigan

“Construction Observer”: The authorized representative of ENGINEER who is assigned to the site or any part thereof.

“OWNER”: The public body or authority, corporation, association, firm or person with whom CONTRACTOR has entered into the Agreement: and for whom the work is to be provided; and the party of the first part of the Contract.

“Project Manual” – The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.

“Specifications” - Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto.

“Subcontractor”: A person, firm or corporation having a direct contract with CONTRACTOR or with any other subcontractor for the performance of a part of the Work at the site.

“Supplier”: A manufacturer, fabricator, supplier, distributor, material man or vendor.

“Supplemental Conditions”: The part of the Contract Documents that amends or supplements the General Conditions and/or the Insurance Specifications and the Bond Requirements.

“Work” - The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work is the result of performing services, furnishing labor and furnishing and incorporating materials and equipment into the construction, all as required by the Contract Documents.

“Written Notice”: Shall be deemed to have been “duly served” when such notice shall have been given or mailed to the CONTRACTOR or his superintendent at the site of the Work or when such notice shall have been given or mailed to the OWNER.

2. CONTRACT DOCUMENTS

The original and three counterparts of the Contract shall be signed by the OWNER and the CONTRACTOR.

The Work under this Contract shall consist of the items listed in the Bid Form, including all incidentals necessary to fully complete the project in accordance with the Contract Documents. The Contract Documents shall consist of the Advertisement, Instructions to Bidders, Supplemental Instructions to Bidders, Supplemental Specifications, Bid Form, Project Plans and Drawings, Standard Plans and Details, Technical Specifications,

General Conditions, General Specifications, Method of Payment, Insurance, Bonds and Agreement.

The Contract Documents comprise the entire agreement between OWNER and CONTRACTOR. The Contract Documents are complimentary, and what is called for by any one shall be as binding as if called for by all. The intent of the Contract Documents is to include in the Contract Price the cost of all labor and material, water, fuel, tools, plant, equipment, light, transportation and all other expenses that may be necessary for the proper execution and completion of the Work.

3. BONDS

The CONTRACTOR shall furnish a surety bond (form included) in an amount at least equal to 100 percent of the Contract Price as security for faithful performance of this Contract. CONTRACTOR shall also furnish a separate surety bond (form included) in an amount at least equal to 100 percent of the Contract Price as security for the payment of all persons performing labor on the project under this Contract, and furnishing materials in connection with this Contract. The Surety on each such bond shall be a duly authorized surety company satisfactory to the OWNER.

The CONTRACTOR shall furnish a Maintenance and Guarantee Bond (form included) covering all Work under this Contract. The guarantee is to cover fifty percent (50%) of the contract amount for a period of two (2) years subsequent to the date of final payment unless otherwise specified.

Should any Surety upon any bond furnished in connection with this Contract become unacceptable to the OWNER, or if any such Surety shall fail to furnish reports as to his financial condition from time to time as requested by the ENGINEER, the CONTRACTOR must promptly furnish such additional security as may be required from time to time by the ENGINEER to protect the interests of the OWNER or persons supplying labor or materials in the

prosecution of the Work contemplated by the Contract.

4. CONTRACT DRAWINGS & SPECIFICATIONS

The original drawings prepared by the ENGINEER and included in the Contract Documents may be supplemented by other drawings furnished by the CONTRACTOR and approved by the ENGINEER or supplied to the CONTRACTOR by the ENGINEER during progress of the Work as he may deem to be necessary or expedient. All such supplementary Contract Drawings or instructions are intended to be consistent with the Contract Documents, true developments thereof, and reasonably inferable therefrom. Therefore, no extra charge will be allowed on a claim that particular supplemental contract drawings or instructions differed from the Contract Documents, incurring extra work, unless CONTRACTOR has first brought the matter, in writing, to the ENGINEER's attention for proper adjustment before starting on the work covered by such, and has received from the ENGINEER an order, in writing, to so proceed.

These original and supplemental drawings constitute the drawings according to which the Work is to be done. The CONTRACTOR shall keep at the site of the Work an approved or confirmed copy of all drawings and specifications, and shall at all times give the ENGINEER and OWNER access thereto.

5. COORDINATION OF CONTRACT DOCUMENTS

In case of discrepancy, figured dimensions shall govern over scaled dimensions and the parts of the Contract will prevail over all other parts of the following order:

Supplemental Specifications

Supplemental Instructions to Bidders

Instructions to Bidders

Bid Form

Project Plans and Drawings

Standard Plans & Details

Method of Payment

Technical Specifications

General Conditions

General Specifications

Insurance Specifications and Bond Forms

The CONTRACTOR shall not take advantage of any apparent error or omission in the Contract Documents, and if any inconsistency, omission, or conflict is discovered in the Contract Documents, or if in any place the meaning of the Contract Documents is obscure, uncertain, or in dispute, the ENGINEER will decide as to the true intent.

Information regarding site of the Work given in drawings and specifications has been obtained by the ENGINEER and is believed to be reasonably correct, but the OWNER does not warrant either the completeness or accuracy of such information, and it is the CONTRACTOR's responsibility to verify all such information.

6. PRECONSTRUCTION MEETING

A preconstruction meeting will be held prior to the beginning of any work. The ENGINEER will schedule the meeting as soon as possible after acceptable executed Contract Documents are received from the CONTRACTOR.

Notice of the meeting will be made to the OWNER, the CONTRACTOR, and to the following applicable entities, contingent upon their interest in the project:

Utility Companies

County Road Commission

Michigan Department of Transportation (MDOT)

Michigan Department of Labor-Safety Division

Railroad Companies

Other State, Local and County Agencies

The purpose of the preconstruction meeting is to discuss particular procedures and potential problem areas. The CONTRACTOR is given updates on the conditions of the proposed construction and what is expected as to proper notification in the event of damage to existing utilities.

The CONTRACTOR shall submit in writing at the preconstruction meeting the following information:

Schedule of construction

Sources of materials

Final list of subcontractors

The designated safety officer on the job

Superintendent for the project

Foreman in charge on the job site

Emergency and after hours phone numbers for CONTRACTOR, including Safety Officer, Superintendent and Foreman.

Approval by ENGINEER and OWNER of any construction schedule indicating completion of the work in less time than allotted by the Contract shall not be construed as an acknowledgment, either express or implied, that the work can be completed within the time shown on this schedule, and shall not under any circumstances give rise to a cause of action for damages by the CONTRACTOR.

7. REUSE OF DOCUMENTS

Neither CONTRACTOR nor any subcontractor or supplier or other person or organization performing or furnishing any of the Work under a direct or indirect contract with OWNER shall have or acquire any title to or ownership rights in any of the drawings, specifications or other documents (or copies of any thereof) prepared by or bearing the seal of ENGINEER; and they shall not reuse any of them on extensions of the project or any other project without written consent of OWNER and ENGINEER and specific written verification or adaptation by ENGINEER.

8. AVAILABILITY OF LANDS

OWNER shall furnish, as indicated in the Contract Documents, the lands upon which the work is to be performed, rights-of-way for access thereto, and such other lands which are designated for the use of CONTRACTOR. CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

Permission to use private property shall be obtained prior to any such use by the CONTRACTOR. Written evidence of such permission shall be given to the ENGINEER prior to any such use.

9. PHYSICAL CONDITIONS

Reference is made to the Supplemental Instructions to Bidders for identification of those reports of investigations and tests of subsurface and latent physical conditions at the site or otherwise affecting cost, progress or performance of the Work which have been relied upon by the ENGINEER in preparation of the drawings and specifications. Such reports are not guaranteed as to accuracy or completeness and are not part of the Contract Documents.

10. GENERAL REQUIREMENTS OF MATERIALS & WORKMANSHIP

In the specifications where a particular material or piece of equipment is specified by reference to some particular make or type, or equal, it is not the intent to limit competition but to set up by such reference a standard of quality most easily understood and defined. If materials or equipment of other make or type other than that specified by name are offered by CONTRACTOR they will be given full consideration by the ENGINEER, and the ENGINEER's decision will be final as to whether the materials or equipment offered are equal to those specified.

Unless otherwise stipulated in the specifications, all equipment, materials and articles incorporated in the Work covered by this Contract are to be new and of the best grade of their respective kinds for the

purpose. The CONTRACTOR shall, if required, furnish such evidence as to kind and quality of materials as the ENGINEER may require.

The CONTRACTOR shall furnish suitable tools and building appliances and employ competent labor to perform the work to be done, and any labor, tools or appliances that shall not, in the judgment of the ENGINEER, be suitable or competent to produce this result may be ordered from the Work by him, and such labor, tools or appliances shall be substituted therefore by the CONTRACTOR as will meet with the approval of the ENGINEER.

If not otherwise provided, material or work called for in this Contract shall be furnished and performed in accordance with well-known established practice and standards recognized by architects, engineers and the trade.

11. SHOP DRAWINGS & SPECIAL DRAWINGS

Where called for in the specifications, CONTRACTOR shall submit to the ENGINEER for approval in not less than five copies, details, specifications, cuts and drawings of such equipment and structural work as may be required. CONTRACTOR shall make any changes or alterations required by the ENGINEER and resubmit same without delay. Approval of the ENGINEER shall not relieve the CONTRACTOR of responsibility for errors in the drawings, as the ENGINEER's checking is intended to cover compliance with the drawings and specifications and not to enter into every detail of the shop work. No work shall be undertaken until the ENGINEER has approved the shop drawings.

When the work of the CONTRACTOR is of a nature originating with it, full general and detail drawings shall be furnished to the ENGINEER on 24" x 36" size sheets of polyester film base which shall, upon approval, become the property of the OWNER.

It is understood that approval by the ENGINEER of CONTRACTOR's drawings, whether general or detailed, is a general approval relating only to their sufficiency and compliance with waiver of errors, discrepancies or omissions.

12. CHANGES IN QUANTITIES OR PLANS

The OWNER reserves the right to make, by written order, at any time during the Work, such changes in quantities and such alterations in the work as are necessary to satisfactorily complete the project. Such changes in quantities and alterations shall not invalidate the Contract nor release the Surety, and by signing a work order or authorization, the CONTRACTOR agrees to perform the Work as altered and agrees to accept, as payment in full for such Work, the monetary amounts set forth in such written order as balanced by OWNER. In addition, by signing a written order, the CONTRACTOR releases the OWNER from any and all claims for compensation with regard to the items of work specified in the written order; including, but not limited to, any and all claims for delay and overhead, unless the OWNER is notified in writing at the time of signing the authorization that the CONTRACTOR refuses to release the OWNER from such claims. All increases in quantities of work which appear in the Contract as pay items shall be paid for at the Contract Unit Prices. Decreases in quantities included in the Contract shall be deducted from the Contract at the Contract Unit Prices.

13. ESTIMATED QUANTITIES

The quantities of various classes of work to be done and materials to be furnished under this Contract, which have been estimated as stated elsewhere herein, are approximate and only for the purpose of comparing, on a uniform basis, the bids offered for work under this Contract; and neither the OWNER nor the ENGINEER is to be held responsible should any of the said estimated quantities be found incorrect during the construction of the work; and the

CONTRACTOR shall make no claim for anticipated profit, nor for loss of profit, because of a difference between the quantities of the various classes of work actually done or materials actually delivered, and the estimated quantities as herein stated.

14. PAYMENTS

Payments for work completed, as recommended by the ENGINEER, will be made as specified herein.

Partial Payments

CONTRACTOR shall submit to OWNER an application for each payment and shall submit a Contractor's Declaration declaring that he has not performed any work, furnished any material, sustained any loss, damage or delay for any reasons, including soil conditions encountered or created, or otherwise done anything for which he will ask, demand, sue for, or claim compensation from the OWNER other than as indicated on the Contractor's Declaration and shall, if required, submit receipts or other vouchers showing his payments for materials and labor, including payments to subcontractors.

Payments, based on progress estimates, will be made on a monthly basis on work completed during the preceding month, less retainage held in accordance with Public Act No. 524 of 1980.

The retainage shall be as follows:

Not more than ten percent (10%) of the dollar value of all work in place until work is fifty percent (50%) in place.

After the work is fifty percent (50%) in place, additional retainage shall not be withheld unless the OWNER determines that the CONTRACTOR is not making satisfactory progress, or for other specific cause relating to the CONTRACTOR's performance under the Contract. If the OWNER so determines, then the retainage amount shall not be more than ten percent (10%) of the dollar value of work more than fifty percent (50%) in place.

Retainage shall be released to CONTRACTOR together with the final progress payment.

The OWNER may withhold payment of any estimate or portion of estimate until the CONTRACTOR shall have furnished satisfactory evidence that he has paid all claims of every nature. The CONTRACTOR shall submit to the OWNER with each application for payment a "Sworn Statement" attesting to all payments made and balances due to all subcontractors and to all suppliers of materials, fuel, and equipment for the project work completed. He shall also attest to all payments made for labor furnished for the work completed. The "Sworn Statement" shall be in a form acceptable to the OWNER and all suppliers and subcontractors shall be listed along with payments made and balances owed to each.

No partial payment shall be considered as acceptance of the work or any portion thereof prior to final completion of the work, and payment of final estimate.

Final Payment

The CONTRACTOR's request for final payment shall be accompanied by the following documents:

Contractor's Declaration

Contractor's Affidavit

Unconditional waivers, as required, from major suppliers and subcontractors

Release of Surety

Release from other public agencies for which permits have been obtained under this Agreement.

Within thirty (30) days after completion of the work under this Agreement to the satisfaction of the OWNER and ENGINEER, in accordance with all and singular terms and stipulations herein contained, the OWNER shall make final payment, from a final estimate made by the ENGINEER. Before final payment is made, the CONTRACTOR shall, as directed by the OWNER, make a Contractor's Affidavit that he has paid all claims of every nature, or

secured a release from the Surety or Sureties approving payment of the final estimate by the OWNER. Final payment, when made, shall be considered as final approval and acceptance of the completed work herein specified.

The acceptance by the CONTRACTOR of final payment aforesaid shall operate as, and shall be, a release to the OWNER and his agents, from all claim and liability to the CONTRACTOR for anything done or furnished for, relating to, or affecting the work.

Incorrect/Improper Payments

OWNER shall not, nor shall any officer thereof, be precluded or stopped by any return or certificate made or given by the ENGINEER, or other officer, agent or appointee, under the provision of this Agreement, at any time (either before or after final completion and acceptance of the work and payment made therefore pursuant to any such return or certificates showing the true and correct amount of money due therefore, notwithstanding any such return or certificate, or any payment made in accordance therewith) from demanding and receiving from the CONTRACTOR or his sureties, separately or collectively, such sums as may have been improperly paid said CONTRACTOR by reason of any such return or certificate which has been untruly or incorrectly compiled.

15. EXTENSION OF TIME

All days in which work is suspended by order of the ENGINEER, or in accordance with these specifications, shall automatically extend the time for completion an equal number of days.

In the event work is suspended because the CONTRACTOR does not perform, no extension will be allowed for this period of time.

All requests from CONTRACTOR for extensions of time shall be submitted in writing. Such requests shall detail the reason for the request, provide a realistic revised completion date, and indicate any other

areas which may be impacted by such an extension. Such requests must be submitted to the field ENGINEER within ten (10) days after the occurrence of the incident or situation that brought about a reason for extending the time of completion. The final decision of whether or not to grant an extension of time will be made by the field ENGINEER. In no case will a request be considered if it is submitted after the ten (10) day period has passed.

16. AUTHORITY

No officer, agent or employee of the OWNER shall have power to revoke, alter, enlarge, or relax the stipulations or requirements of the Contract Documents, except insofar as such authority may be specifically conferred by the Contract Documents themselves, without formal authorization to do so, conferred by the Agreement, or by ordinance, resolution or other usual official action by the OWNER.

17. PROGRESS OF WORK

The work shall be prosecuted regularly and uninterruptedly, unless the OWNER shall otherwise specifically direct, with such force and at such points as to insure its full completion within the time stated herein.

If, in the opinion of the ENGINEER, it is necessary or advisable that certain portions of the work be done immediately, the CONTRACTOR, upon written order shall proceed with such work without delay. Should he fail to so proceed, the OWNER may do or cause to be done, such work, and the cost of same will be deducted from any money due or to become due the CONTRACTOR under this Agreement.

18. TIME IS ESSENCE OF CONTRACT

It is distinctly understood and agreed to by the parties hereto that the time specified for completion of the Work is the essence of this Agreement, and CONTRACTOR shall not be entitled to claim performance of this Agreement unless the work is satisfactorily completed, in every respect, within the time herein specified.

19. COMMENCEMENT OF CONTRACT TIME

The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within thirty (30) days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth (60) day after the day of Bid Opening or the thirtieth (30) day after the Effective Date of the Agreement, whichever date is earlier.

Owner Responsibilities

20. EXTRA & FORCE ACCOUNT WORK

When extra work is required, it shall be performed and payment for such work will be on the unit price or lump sum basis agreed to in a written order. When such agreement cannot be reached, the OWNER may order such work, including any required offsite work, to be done by force account. The compensation as herein provided shall be accepted by the CONTRACTOR as payment in full for extra work done by force account, and the said percentages shall cover profit, superintendence, general expense, overhead, miscellaneous unforeseen costs, and the use of small tools and equipment. For approved subcontract work, the CONTRACTOR will be paid an amount equal to six percent (6%) of the total cost of the subcontract work, as reimbursement for administrative costs incurred in connection with the subcontract work.

When it is necessary for the CONTRACTOR to hire a firm to perform a specialized type of work or service for which the CONTRACTOR or subcontractors are not qualified to do, payment will be made at the invoice cost. The CONTRACTOR will be paid an amount equal to six percent (6%) of the invoice cost, as reimbursement for administrative costs. Prior approval by the OWNER is required.

REPORTS:

The CONTRACTOR shall furnish to the OWNER, itemized reports of the costs of all force account work. The reports shall be furnished each week and shall include a certified copy of the weekly payroll and copies of bills for the materials used and the freight charges paid on same. Discount for prompt payment or penalty for late payment will not be considered in determining the net amount of the bill. The net amount of the bill shall be charged to the force account work. Where materials used are not specifically purchased for use on extra work but are taken from the CONTRACTOR's stock, the CONTRACTOR shall submit a certification of the quantity, price, and freight on such materials in lieu of original bills and invoices.

The CONTRACTOR shall prepare itemized statements containing the following detailed information:

Labor: Name, classification, dates, number of hours worked each day, total hours computed to nearest half hour, total hours, rate, and extension for each employee engaged.

Equipment: Designation, number of hours used each day (computed to nearest half hour), total hours, rental rate, and extension for each unit of equipment engaged.

Materials: Quantities of materials, with prices per unit and extensions and freight costs when applicable.

The CONTRACTOR and the OWNER shall compare records of force account work and bring them into agreement at the end of each day.

LABOR:

For all labor and for all craft foreman directly engaged in the specific work, the CONTRACTOR will be paid the actual rate of wages and the number of hours paid said labor and foremen in accordance with approved labor agreements, computed to nearest half hour, to which sum twenty-six (26) percent will be added (this sum includes a one (1) percent allowance for the

Single Business Tax). Project foremen will be classified as Superintendents and their compensation will not be included in the payment provided herein.

Bond Premium: Workmen's Compensation Insurance; Personal Injury Public Liability and Property Damage Public Liability Insurance; Unemployment Compensation; Federal Social Security; and payments required to be made to Employer and Employee Trusteships, the proceeds from which accrue exclusively to the benefit of the employee; will be paid for at actual cost, to which sum twenty (20) percent will be added except that twenty-six (26) percent will be added to the taxable fringe benefits. The CONTRACTOR shall furnish satisfactory evidence of the amounts paid for each of these required costs as related to force account work.

MATERIALS:

For materials, the CONTRACTOR will receive the actual cost delivered to the project site, including freight charges, as shown by copies of bills, to which sum fifteen (15) percent will be added.

If a charge in the amount or type of force account work results in a surplus of the material ordered and delivered to the project site, the OWNER will reimburse the CONTRACTOR for the costs incurred in returning the surplus material to the supplier.

SMALL HAND & POWER TOOLS:

No payment will be allowed for small hand and power tools which are not listed in the Rental Rate Blue Book for Construction Equipment as published by the Equipment Guide Book Company. All small hand and power tools listed in the Rental Rate Blue Book at a rate of less than one (1) dollar per hour will be considered part of overhead and will not be paid for separately.

EQUIPMENT:

For any machinery and equipment, including the foreman's transportation unit, which the OWNER approves for use on extra work

done by force account, the CONTRACTOR will be paid as follows:

The time paid for shall be the period that the equipment is required at the site of the extra work and, in addition, shall include traveling time to the location of the extra work when the equipment is moved under its own power. When transportation from one site to another is by other than its own power, the actual operating time during periods of loading and unloading will be paid for at the regular rental rate and transportation costs will be allowed.

When the periods of work are not consecutive and the interval between the termination of a period of work and the commencement of the subsequent period does not exceed thirty (30) days, the rates allowed will be the same as if the periods of work were consecutive.

The rental rate established for each piece of CONTRACTOR owned equipment, including appurtenances and attachments to equipment used will be determined by use of the Rental Rate Blue Book for Construction Equipment Volume 1, 2, or 3, as applicable. The edition which is current at the time the force account work was started will apply.

The established rental rate will be equal to the "Monthly" rate divided by 176; modified by the rate adjustment factor and the applicable map adjustment factor, plus the "Estimated Operating Costs per Hour", to which sum ten (10) percent will be added.

For equipment not listed in the Rental Rate Blue Book, Volume 1, 2, or 3, the rental rate will be determined by using the rate listed for a similar piece of equipment or by proportioning a rate listed so that the capacity, size, horsepower, and age are properly considered.

For equipment for which there are no comparable in the Rental Rate Blue Book, Volume 1, 2, or 3, the monthly rate shall be reasonable, but not more than five (5) percent of the current list price, or invoice, of the equipment. The base hourly rate shall then be determined by dividing the monthly rate by 176 to which sum twenty percent

(20%) will be added. The twenty percent (20%) includes adjustments and operating costs.

The rates used for CONTRACTOR owned trucks used to haul material will be those published by MDOT. These rates shall include all adjustments and operating costs. Separate payment for the driver will be allowed. The rates will be reviewed and adjusted periodically.

The rental rate for the foreman's transportation unit will be seven dollars (\$7.00) per hour, to which sum twenty percent (20%) will be added.

When leased or rented equipment is used on force account work, the hourly rate used in computation of payment will be the leased or rented rate, except that if the leased or rented rate exceeds the rental rate established by the Rental Blue Book, the established rate determined from the Blue Book will apply. In either case, the Estimated Operating Cost per Hour will be added to the appropriate hourly rate to which sum ten percent (10%) will be added.

In all cases the "Estimated Operating Cost per Hour" includes all fuel, oil, lubrications, tires, parts, and other operating expendables such as truck and labor assigned to the truck for servicing the equipment.

The rental rates allowed herein include the cost of insurance covering the usual insurable risks, including fire and theft. The OWNER will not be liable for losses which can be covered by insurance.

In the event that machinery or equipment is idled, payment may be allowed on a rental basis for the idled equipment as specified herein. Only machinery or equipment actually on the project site at the time of the delay, as required for that phase of construction work in question, will be considered eligible for rental reimbursement. Specialized equipment for machinery directly related to the work, whether on or off the site, may be considered eligible for payment if actually idled and if such idleness can be certified by the CONTRACTOR and verified by the

OWNER. Payment for idled equipment and/or machinery will not be allowed during periods of seasonal suspension of the work.

The rental rate for idled leased or rented equipment will be the leased or rented rate, or the equipment shall be returned and taken off rental as directed by the OWNER.

The rental rate for idled CONTRACTOR owned equipment will be the "Monthly" rate divided by 176; modified by the rate adjustment factor and the applicable map adjustment factor, and then multiplied by fifty percent (50%). No payment will be allowed for operating costs.

Payment will be limited to the difference between the hours worked and eight (8) hours in any one day and to the difference between the hours worked and forty (40) hours in any one week. No provisions of these specifications shall entitle the CONTRACTOR to rental compensation for idled equipment. No additional compensation for overhead will be allowed.

In the event that labor is idled, payment may be allowed provided there is no other location within the project that the labor can be gainfully employed. Payment will be limited to a maximum of eight (8) hours per occurrence and in no case will exceed the amount of the CONTRACTOR's obligation as provided by the CONTRACTOR's current labor agreement. No additional compensation for overhead will be allowed.

21. PAYMENTS WITHHELD

The OWNER may withhold or, on account of subsequently discovered evidence, nullify the whole or a part of any certificate for progress payment to such extent as may be necessary to protect itself from loss on account of:

Defective work not remedied;

Claims filed or reasonable evidence indicating probable filing of claims;

Failure of the CONTRACTOR to make payments properly to subcontractors or for material or labor;

A reasonable doubt that the Agreement can be completed for the balance then unpaid;

Damage to another CONTRACTOR.

When the above grounds are removed, payment shall be made for amounts withheld because of them.

22. USE OF COMPLETE PORTIONS OF THE WORK

The OWNER may, at any time during progress of the work, after written notice to CONTRACTOR, take over and place in service any completed portions of the work which are ready for service, although the entire work of the Agreement is not fully completed, and notwithstanding the time for completion of the entire work or such portions may not have expired. In such event, the CONTRACTOR will be relieved of further work on, or maintenance of, said portion except as covered by his guarantee of same.

Engineer Responsibilities

23. ENGINEER DURING CONSTRUCTION

The Work shall be subject to the approval of the ENGINEER, who shall determine the amount, quality, acceptability, and fitness of the items of work and materials to be furnished hereunder, and who shall decide all questions which may arise as to measurements of quantities and fulfillment of the requirements of the Contract Documents.

24. AUTHORITY & DUTIES OF CONSTRUCTION OBSERVER

Construction Observers may be appointed by the ENGINEER and directed to check or review materials used and completed work. The observation may extend to any parts of the Work and to the preparation or manufacture of the materials for use in the Work. Construction Observers will not be authorized to revoke, alter, enlarge, or relax any of the provisions of the Contract Documents. The Construction Observer will call to the attention of the CONTRACTOR any failure to follow the plans and

specifications that he may observe. In case of any dispute arising between the CONTRACTOR and Construction Observer as to materials furnished or the manner of performing the work, the Construction Observer shall have the authority to reject materials or completed items of work until the question at issue can be referred to and be decided by the ENGINEER. In no instance shall any action or omission on the part of the Construction Observer relieve the CONTRACTOR of the responsibility of completing the Work in accordance with the Contract Documents.

25. LIMITATIONS ON ENGINEER'S RESPONSIBILITIES

Neither ENGINEER's authority or responsibility under this Article or under any other provision of the Contract Documents nor any decision made by ENGINEER in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise or performance of any authority or responsibility by ENGINEER shall create, impose or give rise to any duty owed by ENGINEER to CONTRACTOR, any subcontractor, any supplier, any other person or organization, or to any surety for or employee or agent of any of them.

ENGINEER will not supervise, direct, control or have authority over or be responsible for CONTRACTOR's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with laws and regulations applicable to the furnishing or performance of the Work. ENGINEER will not be responsible for CONTRACTOR's failure to perform or furnish the Work in accordance with the Contract Documents.

ENGINEER will not be responsible for the acts or omissions of CONTRACTOR or of any subcontractor, any supplier, or of any other person or organization performing or furnishing any of the Work.

ENGINEER's review of the final application for payment and accompanying

documentation and all maintenance and operating instructions, schedules guarantees, bonds and manufacturer's certificates of inspection, tests, and approvals and other documentation required in Article 14b will only be to determine generally that their content complies with the requirements of, and in the case of manufacturer's certificates of inspections, tests and approvals that the results certified indicate compliance with the Contract Documents.

The limitations upon authority and responsibility set forth in this Section shall also apply to ENGINEER's consultants, authorized representative and assistants.

26. LINES & GRADES

Principal reference lines or points and bench marks may be given by the ENGINEER at such time as he may deem necessary; or, if the CONTRACTOR shall be in need of such reference lines or bench marks, he shall notify the ENGINEER three (3) working days in advance.

The ENGINEER may set suitable stakes and marks showing locations and elevations of the various parts of the work, and will furnish the CONTRACTOR with required data referring to the reference points. No work shall be undertaken until such stakes and marks shall have been set by the ENGINEER. CONTRACTOR shall take due and proper precautions for the preservation of these stakes and marks, shall see that the work at all times proceeds in accordance therewith, and shall provide all labor and material to set the required line and grade control and locate the work accurately with reference to the above points. In case such stakes are destroyed due to the CONTRACTOR's carelessness, they will be replaced at the ENGINEER's earliest convenience and the CONTRACTOR may be back charged for the crew time incurred.

27. TESTING & SAMPLING

Where called for in the specifications, samples of materials in the quantity named shall be submitted to the ENGINEER for approval. Where tests are required, they

shall be made at the expense of the OWNER, except as otherwise called for in the specifications. For materials covered by ASTM or Federal Specifications, or with the specifications of well known or recognized technical and/or trade organizations, unless otherwise stipulated, required tests are to be made by the manufacturer, and his certificate therefore submitted to the ENGINEER.

The ENGINEER and/or OWNER shall determine which materials are required by the specifications to be factory certified or to have chemical or physical analysis or other examination or test. The CONTRACTOR shall furnish to the ENGINEER and/or OWNER two copies of orders for all materials requiring such examination or test as soon as placed. Such orders shall contain complete information, including that as to the quantity, quality, dimensions, sizes, capacities and types, shall contain proper reference to the applicable specifications by title, number and paragraph, and shall show the name and address of the producing factory but need not contain prices or contractual terms.

All materials and workmanship (if not otherwise designated by the specifications) shall be subject to examination and test by the ENGINEER and/or OWNER at any time during manufacture or construction, and at any place where such manufacture or construction is carried on. The ENGINEER and/or OWNER shall have the right to reject defective material and workmanship or require its correction. Rejected workmanship shall be satisfactorily corrected, and rejected material shall be satisfactorily replaced with proper material without charge therefore, and the CONTRACTOR shall promptly segregate and remove rejected material from the premises. If the CONTRACTOR fails to proceed at once with replacement of rejected material and correction of defective workmanship, the OWNER may, by Agreement or otherwise, replace such material and correct such workmanship and charge the cost thereof to the

CONTRACTOR, or may immediately terminate the Agreement.

CONTRACTOR shall furnish promptly, without additional charge, all reasonable facilities, labor and materials necessary for the safe and convenient conduct of all construction observations and tests that may be required by the ENGINEER. All construction observations and tests by the ENGINEER and/or OWNER shall be performed in such a manner as not to delay the work unnecessarily. Special, full size, and performance tests shall be as described in the specifications. CONTRACTOR shall be charged with any additional cost of construction observations when material or workmanship is not ready at the time checking is requested by the CONTRACTOR.

Should it be considered necessary or advisable by the ENGINEER and/or OWNER any time before final acceptance of the entire work to make an examination of work already completed, by removing or tearing out same, the CONTRACTOR shall on request promptly furnish all necessary facilities, labor and material. If such work is found to be defective or nonconforming in any material respect, due to the fault of the CONTRACTOR or his subcontractor, CONTRACTOR shall defray all the expenses of such examination and of satisfactory reconstruction, and be responsible for any resulting delay. If, however, such work is found to meet the requirements of the Agreement, the actual cost involved in the examination and replacement shall be allowed the CONTRACTOR and he shall in addition, if completion of the work has been delayed thereby, be granted a suitable extension of time on account of the additional work involved.

Examination of material and finished articles to be incorporated in the work at the site shall be made at place of production, manufacture or shipment stated in the specifications; and such examinations and acceptance, unless otherwise stated in the specifications, shall be final, except as

regards latent defects, departures from specific requirements of the Agreement and the specifications and drawings made a part thereof, damage or loss in transit, fraud or such gross mistakes as amount to fraud. Subject to requirements contained in the preceding sentence, examinations of material and workmanship for final acceptance as a whole or in part shall be made at the site.

Contractor Responsibilities

28. UNFORSEEN PHYSICAL CONDITIONS

CONTRACTOR shall promptly notify the OWNER and ENGINEER in writing of any subsurface or latent physical conditions at the site or in an existing structure differing materially from those indicated or referred to in the Contract Documents. The ENGINEER will promptly review those conditions and advise the OWNER in writing if further investigation or tests are necessary. Promptly thereafter, the OWNER shall obtain the necessary additional investigations and tests and furnish copies to the ENGINEER and the CONTRACTOR. If the ENGINEER finds that the results of such investigations or tests indicate that there are subsurface or latent physical conditions which differ materially from those intended in the Contract Documents, and which could not reasonably have been anticipated by the CONTRACTOR, a Change Order may be issued incorporating the necessary revisions.

29. COMPOSITION OF THE CONTRACTOR

If the CONTRACTOR hereunder is comprised of more than one legal entity, each such entity shall be jointly and severally liable hereunder.

30. ASSIGNMENT OF CONTRACT

The CONTRACTOR shall not sublet, assign or transfer this Agreement or any portion thereof or any payments due him thereunder, without the written consent of the OWNER.

Assignment or subletting the whole or any portion of this Agreement shall not operate

to release the CONTRACTOR or his bondsmen hereunder from any of the contract obligations.

The CONTRACTOR agrees that he is fully responsible to the OWNER for the acts and omissions of his subcontractors and of persons either directly or indirectly employed by him. Nothing contained in the Contract Documents shall create any contractual relation between any subcontractors and the OWNER.

Neither the ENGINEER nor any officer, agent or employee of the OWNER shall have any power or authority whatsoever to bind the OWNER or to incur obligation in his behalf to any subcontractors, material supplier or other persons in any manner whatsoever.

31. AGENTS

Work shall be carried on under personal supervision of the CONTRACTOR or his properly authorized representative, who shall be on the grounds at all times during the construction, and who shall have full and responsible charge of the Work with power to receive orders and carry out instructions.

32. SAFETY & PROTECTION

A. People and Property

CONTRACTOR shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

All persons on the site or who may be affected by the Work;

All the Work and materials and equipment to be incorporated therein, whether in storage on or off the site; and

Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Site Safety

CONTRACTOR shall comply with all applicable laws and regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. CONTRACTOR shall notify owners of adjacent property and of underground facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property. All damage, injury, or loss to any property referred to in this section caused, directly or indirectly, in whole or in part, by CONTRACTOR or any subcontractor, supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR. CONTRACTOR's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and ENGINEER has issued a notice to OWNER and CONTRACTOR that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

C. Safety Representative

CONTRACTOR shall designate a qualified and experienced safety representative at the site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

D. Hazard Communication Program

CONTRACTOR shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the site in accordance with laws or regulations.

E. Compliance with MIOSHA

All of the CONTRACTOR and subcontractors operations and construction equipment shall comply with requirements of the Michigan Occupational Safety and Health Act (MIOSHA) insofar as they apply to the work to be performed under this Contract.

33. CONTRACTOR'S SUPERVISION & ORIGINATION

The Work under this Agreement shall be under the direct supervision and direction of the CONTRACTOR. The CONTRACTOR shall give sufficient supervision to the Work, using his best skill and attention. The CONTRACTOR shall, at all times, keep on the site of the Work during its progress a competent superintendent and any and all necessary foremen and assistants. The superintendent shall represent and have full authority to act for the CONTRACTOR in the latter's absence, and all directions given to him shall be as binding as if given to the CONTRACTOR. On written request in each case, all such directions will be confirmed in writing to the CONTRACTOR.

The CONTRACTOR shall employ only competent, efficient workmen and shall not use on the Work any unfit person or one not skilled in the work assigned to him, and he shall at all times enforce strict discipline and good order among his employees. Whenever the ENGINEER shall notify the CONTRACTOR, in writing, that any man on the Work is, in the opinion of the ENGINEER, careless, incompetent, disorderly, or otherwise unsatisfactory, such man shall be discharged from the work and shall not again be employed on it except with the written consent of the ENGINEER.

The CONTRACTOR shall establish and maintain an office on the site of the work, or at some convenient point adjacent thereto, during the continuance of this Agreement and shall have at all times during working hours, a representative authorized to receive and execute any and all orders, when given by the ENGINEER; and such order, when given out and received by said representative shall be deemed to have been

given to and received by the CONTRACTOR. Copies of the drawings and specifications shall at all times be kept on file by the CONTRACTOR at readily accessible points near the work.

34. CONTRACTOR'S RIGHT TO STOP WORK

If the work should be stopped under an order of any court, or other public authority for a period of three months, through no act or fault of the CONTRACTOR or of anyone employed by him, or if the OWNER should fail to pay to the CONTRACTOR within sixty (60) days of its maturity and presentation any sum certified by the ENGINEER, provided no appeal is taken, the CONTRACTOR may, upon seven (7) days' written notice to the OWNER and the ENGINEER, stop work or terminate this Agreement, and shall receive from the OWNER payment in full for all work executed, as determined from the prices contained in the approved detailed estimate as computed by the ENGINEER, but no claim for extra compensation or damages shall be made or allowed because of such termination of the Agreement.

35. STORAGE OF MATERIALS

Materials and equipment distributed, stored and placed upon or near the site of the Work shall at all times be so disposed as not to interfere with work being prosecuted by other contractors in the employ of the OWNER, or with street drainage, or with fire hydrants or with access thereto, and not to hinder any more than may be necessary the ordinary traffic (either vehicular or pedestrian) of the street.

36. CLEANING UP

The CONTRACTOR shall, as directed by the ENGINEER, remove at his own expense from the OWNER's property and from all public and private property all temporary structures, rubbish and waste materials resulting from his operations. This requirement shall not apply to property used for permanent disposal of rubbish or waste materials in accordance with permission of

such disposal granted to the CONTRACTOR by the OWNER thereof.

37. SUNDAY & NIGHT WORK

The CONTRACTOR is required to prosecute work done under this Agreement during the hours of daylight, and no work will be permitted at night or on Sundays, except to save property or life, or as specifically authorized or directed by the ENGINEER.

No work shall be permitted on holidays.

38. SANITARY REGULATIONS

Sanitary conveniences for the use of project personnel properly secluded from public observation shall be constructed and maintained in sanitary condition by the CONTRACTOR. Its use shall be strictly enforced.

39. PERMITS & REGULATIONS

The CONTRACTOR shall secure, at no cost to the OWNER, all permits and licenses necessary for the prosecution of the Work. He shall pay for same at his own expense as well as for any inspection fees required in connection with such permits, and shall conduct his operations in accordance with the provisions of such permits, including tunneling of pavements where required. He shall also furnish any required bonds and pay the cost of same.

The CONTRACTOR shall keep himself fully informed of all laws, ordinances, and regulations in any manner affecting those engaged or employed in the Work or materials used in the Work, or in any way affecting the conduct of the Work, and of all orders and decrees of bodies or tribunals having any jurisdiction or authority over the same.

He shall at all times observe and comply with, and shall cause all his agents and employees to observe and comply with all existing and future laws, ordinances, regulations, orders and decrees; provided, that if the drawings and specifications are at variance therewith, the CONTRACTOR shall promptly notify the ENGINEER in

writing and any necessary changes shall be adjusted as provided in the Contract Documents.

All work shall be executed and checked in accordance with all local and state rules and regulations and all established codes applicable thereto and shall conform in all respects to the requirements of all competent authorities having jurisdiction there over.

Should any change in plans and specifications be required to comply with local regulations, CONTRACTOR shall notify the OWNER at the time of submitting his bid. After entering into Agreement, CONTRACTOR will be held to complete the work necessary to meet local requirements without extra expense to the OWNER.

Where the work required by the drawings and specifications is above the standard required, it shall be done as shown or specified.

40. GUARANTEE

The CONTRACTOR, as a condition precedent to final payment, shall execute a guarantee to the OWNER warranting for a period of two (2) years from date of final payment to keep in good order and repair any defect in all the work done under the Agreement, either by the CONTRACTOR, his subcontractors, or material suppliers, that may develop during said period due to improper materials, defective equipment, improper materials workmanship, or arrangements, and any other work affected in making good such imperfections shall also be made good, all without expense to the OWNER, and CONTRACTOR shall execute, in favor of the OWNER the attached Maintenance and Guarantee Bond.

41. PATENTS

CONTRACTOR shall pay all royalties and license fees and shall hold and save the OWNER and his agents harmless from all liability of any nature or kind, including cost and expenses for, or on account of, any patented or unpatented invention, process, article or appliance manufactured or used in

performance of the Agreement, including its use by the OWNER, unless otherwise specifically stipulated in the Contract Documents. In this respect the CONTRACTOR shall defend all suits or claims for infringement of any patent or license right.

In the event that any claim, suit or action at law or inequity of any kind whatsoever is brought against the OWNER, involving any such patents or license rights, then the OWNER shall have the right to, and may retain, from any money due or to become due to the CONTRACTOR, such sufficient sum as is considered necessary to protect said OWNER against loss, and such sum may be retained by the OWNER until such claim or suit shall have been settled and satisfactory evidence to that effect shall have been furnished the OWNER.

42. INFORMATION BY THE CONTRACTOR

The CONTRACTOR shall submit to the ENGINEER full information as to the materials, equipment and arrangements that the CONTRACTOR proposes to furnish. This information shall be complete to the extent that the ENGINEER may intelligently judge if the proposed materials, equipment and arrangements will meet with the requirements of the Contract Documents.

Prior to approval of the materials, equipment and arrangements by the ENGINEER, based on the information submitted by the CONTRACTOR, any work done by the CONTRACTOR shall be at his own risk.

Approval of information covering materials, equipment and arrangements by the ENGINEER shall in no way release CONTRACTOR from his responsibility for the proper design, installation and performance of any material, equipment or arrangement, or from his liability to replace same should it prove defective.

43. FORFEITURE OF CONTRACT

If work to be done under the Contract Documents shall be abandoned by CONTRACTOR or if, at any time in the

judgment of the OWNER, CONTRACTOR shall fail to prosecute the Work at a reasonable rate of progress, or to comply with all or any of the terms and requirements herein set forth, then the OWNER shall have the right to take possession of the Work, including CONTRACTOR's plant, supplies and materials, at any time after having notified the CONTRACTOR, in writing, to discontinue work under this Agreement for said cause or causes, and such action shall not affect the right of the OWNER to recover damages resulting from such failure. Upon receiving such notice the CONTRACTOR shall and will, upon demand, immediately give the OWNER safe and peaceable possession of the Work, including the plant, and shall then cease to have control over any portion thereof or the men employed thereon.

The OWNER may then proceed to complete the Work herein specified, by Agreement or otherwise; and the entire cost of same shall be charged to the CONTRACTOR and deducted from any sum or sums due or to become due under the Agreement; the excess cost, if any, to be paid by CONTRACTOR or his sureties to said OWNER.

44. RELATION TO OTHER CONTRACTORS

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

45. "OR EQUAL" CLAUSE

Whenever, in any of the Contract Documents an article, material or equipment

is defined by describing a proprietary product or by using the name of a manufacturer or vendor, the term "or equal", if not inserted, shall be implied. The specific article, material or equipment mentioned shall be understood as indicating the type, function, minimum standard of design, efficiency and quality desired, and shall not be construed in such a manner as to exclude manufacturers' products of comparable quality, design and efficiency. If the CONTRACTOR proposes any "or equal" substitutes, these substitutes shall be subject to the review and approval of the OWNER before they can be incorporated into the work.

Legal

46. INDEMNIFICATION

To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER and ENGINEER and their consultants, agents and employees from and against all claims, damages, losses and expenses, direct, indirect or consequential (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs) arising out of or resulting from the performance of the Work, provided that any such claim, damage, loss or expense (a) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including the loss of use resulting therefrom and (b) is caused in whole or in part by any negligent act or omission of CONTRACTOR, any subcontractors, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder or arises by or is imposed by Law and Regulations regardless of the negligence of any such party.

In any and all claims against OWNER or ENGINEER or any of their consultants,

agents or employees by any employee of CONTRACTOR, any subcontractors, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts of them may be liable, the indemnification obligation under the preceding paragraph shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for CONTRACTOR or any such subcontractors or other person or organization under worker's or workmen's compensation acts, disability benefit acts or other employee benefit acts.

The obligations of the CONTRACTOR under this article shall not extend to the liability of ENGINEER, ENGINEER's consultants, agents or employees arising out of the preparation or approval of drawings, opinions, reports, surveys, change orders, designs or specifications.

47. CONTROLLING LAW

In the case of a legal dispute between the OWNER and the CONTRACTOR the law of the state of Michigan shall govern. The venue for resolving any legal dispute between the two parties will be within the County of the OWNER's legal address.

48. NO WAIVER OF CONTRACT

Neither acceptance of the whole or any part of the Work by the OWNER or his ENGINEER, or any of its agents, nor any order, measurements or certificate by the ENGINEER, nor any order by OWNER for payment of money, nor any payment for the whole or any part of the Work by OWNER, nor any extension of time, nor any possession taken by the OWNER or its agents, shall operate as a waiver for any portion of the Contract Documents or any power therein provided; nor shall any waiver

of any breach of contract be held to be a waiver of any other or subsequent breach.

49. DISPUTE RESOLUTION

Dispute resolution methods and procedures, if any, shall be as set forth in the Supplemental Specifications. If no method and procedure has been set forth, OWNER and CONTRACTOR may exercise such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any dispute.

50. GIVING NOTICE

Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

51. CUMULATIVE REMEDIES

The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provision of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

End of Section

GENERAL SPECIFICATIONS

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1. EXISTING UNDERGROUND STRUCTURES & UTILITIES

The location of public or private utilities shown on the plans is in accordance with the best information available. No guarantee is given that the locations are absolutely accurate or that utilities other than those shown are not present.

For protection of underground utilities, the CONTRACTOR shall contact “MISS DIG” at 1-800-482-7171 a minimum of three (3)

working days prior to excavating. This does not relieve the CONTRACTOR of the responsibility of notifying utility OWNERS who may not be part of the “MISS DIG” alert system.

2. SOIL CONDITIONS

If soil borings have been taken for this project, then they are included in an appendix.

Where the OWNER has caused soil borings to be made to aid the ENGINEER in design of the work, these boring logs are provided herein for the prospective bidder to examine. This information is given to bidders as an aid in determining the character of the soil and groundwater conditions. The OWNER does not guarantee that the ground encountered during construction will conform to the borings. Bidders should secure such other information as they consider necessary to check and supplement the above data.

The CONTRACTOR shall complete the work in whatever materials, and under whatever conditions he may encounter or create.

3. SOIL EROSION AND SEDIMENTATION CONTROL

The CONTRACTOR shall comply with the requirements of the Soil Erosion and Sedimentation Control Act of the State of Michigan, Part 91 of ACT 451 of PA of 1994 and with all the requirements, rules and standards of the official enforcing agent for the project location.

If a soil erosion control permit is required on this project, the CONTRACTOR shall adhere to the specific conditions of the project permit. Where the permit is issued in the name of the CONTRACTOR and requires that a bond be posted, the

CONTRACTOR shall include in his bid the permit fee and bond expense.

The ENGINEER shall have full authority to require compliance with the soil erosion control requirements and may order suspension of the work if measures are not adequate or a problem develops requiring additional soil erosion control measures. Any ordered suspension of the work shall not be grounds for CONTRACTOR's claims for "down time" or "lost time".

4. PRESERVATION, PROTECTION & USE OF SURVEY CONTROLS, MONUMENT POINTS & GRADE STAKES

During the progress of the work, the CONTRACTOR may encounter section line, fractional section line, and property controlling corner monuments. Insofar as is known, such public land survey corners and property monuments have been indicated on the plans.

The CONTRACTOR shall be responsible for complying with the requirements of Michigan Public Act 34. Specifically, he shall be responsible for notifying the county surveyor before removing a public land survey corner monument for construction activities. In addition, if construction time constraints will result in the public land survey corner monument being removed for more than one year, then the CONTRACTOR shall arrange to have a temporary corner monument set until the permanent one can be re-established. The costs of removing and replacing public land survey corner monuments as well as setting temporary corner monuments shall be the responsibility of the CONTRACTOR unless pay items are provided in the bid form for these tasks. The CONTRACTOR shall not remove any such monument until the ENGINEER has witness points as reference for resetting of such monuments. After referencing has been done and suitable permanent sketches prepared, the ENGINEER will give permission to the

CONTRACTOR for removal of the monument. Monuments and monument boxes shall be reset only after all backfilling has fully settled.

The CONTRACTOR shall protect and preserve all monument points, property corners, grade stakes, line and reference points. Where stakes and markers are disturbed or removed due to operations under this Contract, the CONTRACTOR shall be charged at invoice cost by the ENGINEER for replacing the points. Care shall be exercised by the CONTRACTOR when operating near the markers, as any carelessness in operations will also cause a time delay to the schedule due to additional stakeout time required to replace reference points, lines, etc.

The CONTRACTOR shall accurately locate the work from reference points established by the ENGINEER along the surface of the ground and line of work.

5. PROTECTION OF PUBLIC & PRIVATE UTILITIES

Where any utility, water, sewer, gas, telephone or any other public or private utilities are encountered, the CONTRACTOR must provide adequate protection for them, and he will be held responsible for any damages to such utilities arising from his operations.

When it is apparent that construction operations may endanger the foundation of any utility, conduit, or support of any structure, the CONTRACTOR shall notify the utility OWNER of this possibility, and he shall take such steps as may be required to provide temporary bracing or support of conduits or structures.

In all cases where permits or inspection fees are required by utilities in connection with changes to or temporary support of their conduits, the CONTRACTOR shall secure permits and pay all inspection fees.

When it is necessary in order to carry out the work that a pole, telephone or electric, be moved to a new location or moved and replaced after construction, the CONTRACTOR shall arrange for moving such pole or poles and the lines thereof, and shall pay any charges.

Where it is the policy of any utility owner to make his own repairs to damaged conduit or other structures, the CONTRACTOR shall cooperate to the fullest extent with the utility OWNER and shall see that his operations interfere as little as possible with the utility OWNER's operations.

6. MISCELLANEOUS DAMAGES

The CONTRACTOR shall be responsible for repairing all damages to existing lawns, sidewalk, parking lots, streets or other areas outside the limits of the Contract. Private utilities, private ornamental gas or electric lights, sprinkler systems, fences, shrubs, trees, existing sidewalk, or any other surface or subsurface items of value damaged by the CONTRACTOR shall be repaired, replaced or removed and replaced to at least equal condition at the CONTRACTOR's expense unless otherwise specified on the plans.

7. SUMP PUMP DISCHARGE PIPE & LOCAL SERVICES

Any discharge pipe from sump pumps or yard drains encountered on this project, whether or not shown on the plans, which discharges to existing ditches and/or storm sewers or cross public or private easements, shall be maintained, replaced, or reconnected as necessary. Bulkheads shall be placed only as approved by the Engineer. Sump pump connections shall be made to the storm drain pipe by a coring method as approved by the ENGINEER. The CONTRACTOR shall use adequate measures to prevent soil erosion, sedimentation, and/or ponding when connecting discharge pipes to existing or proposed ditches. This work shall be

considered as incidental to the cost of the project.

8. EXISTING SEWER FACILITIES

Existing sewers or drains may be encountered along the line of work. In all such cases, the CONTRACTOR shall perform his operation in such a manner that sewer service will not be interrupted. He shall, at his own expense, make all temporary provisions to maintain sewer service.

Unless otherwise indicated on the plans, the CONTRACTOR shall replace, at his own expense, any disturbed sewer or drain, or relay same at a new grade to be established by the ENGINEER such that sufficient clearance for the sewer will be provided.

9. EXISTING WATER FACILITIES

Where existing water mains and/or water services are encountered in the work, they shall be maintained in operation. They shall be relayed if necessary using the class of pipe and fittings standard to the OWNER of the main.

10. EXISTING GAS FACILITIES

Where existing gas mains are encountered, the CONTRACTOR shall immediately notify the ENGINEER and the gas company. The CONTRACTOR shall then arrange with the gas company for any necessary relocation. The CONTRACTOR will receive no extra compensation on account of delays incurred in conjunction with such relocations.

11. EXISTING ELECTRIC, CABLE, AND TELECOMMUNICATIONS

Where existing electric, cable, or telecommunications facilities are encountered, the CONTRACTOR shall immediately notify the ENGINEER and the affected utility company(ies). The CONTRACTOR shall then arrange with the

utility company for any necessary relocation. The CONTRACTOR will receive no extra compensation on account of delays incurred in conjunction with such relocations.

12. PRESERVATION OF TREES & SHRUBBERY

No trees or shrubbery of any kind shall be removed or destroyed by the CONTRACTOR without written permission of the ENGINEER. The CONTRACTOR will be held fully responsible for any damages caused by his work to adjoining trees and shrubs. Ample precautions shall be taken by the CONTRACTOR to protect such trees and shrubs that are to remain in place by surrounding them with fences or other protection before construction begins. Shrubbery that must be removed shall be preserved and replaced in a manner acceptable to the OWNER.

The CONTRACTOR shall protect and/or replace all shrubbery damaged or destroyed by operations under this Contract. The CONTRACTOR shall receive no extra compensation for preservation of trees and shrubbery.

13. TRIMMING TREES & SHRUBS

Where necessary in the field, the CONTRACTOR shall trim trees and shrubs by a method approved by the ENGINEER. All cut surfaces over one inch in diameter shall be painted with grafting wax. All branches which have been damaged by construction shall be pruned correctly to branch collars, to help promote the health of the tree. Also, any abrasions or gouges afflicted on the tree trunks during construction should be bark traced and lightly coated with tree paint. This work shall be incidental to the project.

14. MAINTENANCE OF SERVICE

Drainage through existing sewers, ditches and drains shall be maintained at all times

during construction, and all nearby gutters shall be kept open for drainage. Where existing sewers are encountered in the line of work that interfere with construction, the flow in the sewers, including both dry weather flow and storm flow, shall be maintained.

During the progress of the work, the CONTRACTOR shall accommodate both vehicular and foot traffic and shall provide free access to fire hydrants, water and gas valves. Except as otherwise specified herein or as noted on the plans, street intersections may be blocked but one-half at a time, and Contractor shall lay and maintain temporary driveways, bridges and crossings such as are necessary, in the opinion of the ENGINEER, to reasonably accommodate the public.

In the event detours, traffic control devices or safety equipment are needed, they shall be placed and maintained in accordance with the Michigan Manual of Uniform Traffic Control Devices (MMUTCD).

Maintenance of service as described above shall be considered as incidental to the project cost unless pay items have been included in the proposal for this work.

15. CLEANLINESS OF THE WORK SITE & STREETS

The CONTRACTOR shall keep the work site and all property occupied by him in a neat and orderly condition at all times. Waste material, rubbish and debris shall not be allowed to accumulate. The CONTRACTOR's equipment, temporary buildings and excess materials shall be promptly removed from the work site when no longer needed. At completion of the work, the premises shall be left clean.

The CONTRACTOR shall keep the streets clean. Trucks hauling excavated material, cement, sand, stone or other loose materials from or to the site shall be tight so that no spillage will occur on adjacent streets. Before trucks start away from the site, their

loads shall be trimmed and covered. If, in the judgment of the OWNER, adequate cleanup efforts are not being expended, including but not limited to, roadway, driveway and drainage maintenance, and removal of surplus materials, further construction shall be halted and work forces directed to the cleanup activity until proper order is restored. Should the CONTRACTOR continue to be negligent of his duties in maintaining proper street cleanliness, the OWNER will take necessary steps to perform such cleaning and shall charge the CONTRACTOR for all the costs.

16. DUST CONTROL

All haul roads, detour roads, temporary access roads, other public or private roads, driveways and parking lots used by the CONTRACTOR must be maintained in a dust free condition for the duration of the Contract. The control of the dust shall be accomplished by application of dust control materials and methods of application as approved and as directed by the ENGINEER. Such dust control materials shall be applied as often as is necessary to control dust. Neglect of dust control will not be tolerated.

Should the CONTRACTOR be negligent of his duties in providing dust control, the OWNER may, with or without notice cause the same to be done and deduct the cost of such work from any monies due or to become due the CONTRACTOR under the Contract. Cost of providing dust control shall be considered incidental to the project.

17. WORKING SPACE & USE OF STREETS OR PRIVATE PROPERTY

The CONTRACTOR's operations in public streets or alleys shall be confined to as small a space as practicable, so as not to cause undue inconvenience to the public or abutting properties, and shall be subject to the approval of the ENGINEER.

Where the CONTRACTOR wishes to work on or stockpile materials on nearby properties, it will be his responsibility to contact the property owner for permission. Upon request, the CONTRACTOR shall provide a copy of written permission from any affected property owner. The OWNER will not become involved with any such agreements and will not be held responsible for any damages that the CONTRACTOR may cause to private property. The CONTRACTOR shall not be compensated for restoration of private properties and stockpile areas unless said areas were within the original project limits.

18. EASEMENTS

Prior to the start of construction, the CONTRACTOR shall verify with the OWNER that any required easements have been obtained.

The CONTRACTOR shall keep his work operations within these easements and shall be responsible for complying with any easement conditions that are shown on the plans or stated in the Contract documents.

19. POWER & LIGHT

The CONTRACTOR shall furnish, at his own expense, all the electric power and lighting necessary during the life of this Contract or until such time as the OWNER takes over the work. The CONTRACTOR shall be responsible for complying with any applicable ordinances or regulations concerning power and light.

20. WATER

Unless otherwise allowed by the OWNER, the CONTRACTOR shall furnish, at his own expense, all the water necessary during the life of this Contract or until such time as the OWNER takes over the work.

The CONTRACTOR shall not make a connection to any public water main or fire

hydrant without first obtaining the necessary permit and/or meter from the OWNER.

Existing public water systems shall be operated and controlled by the OWNER. All valves shall be operated exclusively by the OWNER's personnel.

The CONTRACTOR shall not make any connection to or obtain water from a private water source without obtaining written permission from the owner of the water source. The CONTRACTOR shall provide a copy of the written permission to the OWNER upon request.

21. WEATHER PROTECTION & HEATING

The CONTRACTOR shall provide and maintain weather protection and heating at his own expense to properly protect the work under construction from damage if weather conditions require. This work shall include all windbreaks, insulating cover, and other necessary measures required to provide protection from freezing.

The CONTRACTOR shall continue to provide weather protection and heating as necessary until such time as the OWNER takes over the work.

22. RAILROAD CROSSING

Where the work crosses a railroad right-of way, the CONTRACTOR shall secure Railroad Company approval of his methods and schedule of operation. The CONTRACTOR shall carry out his work in strict accordance with the standards of the Railroad Company. The CONTRACTOR shall pay any inspection, signal or flagman costs.

23. OWNERSHIP OF SALVAGED MATERIALS

All salvageable materials such as castings, hydrants, valves, culverts and similar items removed during construction shall remain

the property of the OWNER. The CONTRACTOR shall deliver these salvaged materials to the OWNER's public works facility. If the OWNER indicates that he does not want the salvaged items, then the CONTRACTOR shall be responsible for disposal of the items.

End of Section

EARTHWORK

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GENERAL

1. SCOPE OF WORK

This work shall be subject to the General Conditions and the General Specifications. The work shall include furnishing of labor,

materials, tools, equipment, accessories and services necessary for completing the excavation and backfilling for the items as shown on the contract drawings and/or as herein required. This also includes trenching, trench or subgrade undercutting, roadway earthwork, complete and continual drainage of excavation, sheet piling, bracing and shoring of sides of the excavation, backfilling around structures and over pipelines, and the disposal of excess excavated material.

2. MDOT

References to Michigan Department of Transportation (MDOT) Specifications shall pertain to the 2012 Standard Specifications for Construction.

MATERIALS

3. BEDDING

- A. Sand shall be a sharp, clean sand free of lumps of clay or debris with 100 percent passing a 3/8-inch sieve and less than 10 percent loss by wash.
- B. Granular material shall meet the requirements of Section 902.07 of the MDOT Standard Specifications for Construction for Granular Material Class II and Class III.
- C. Pea gravel shall be unwashed and shall be from 1/4-inch to 5/8-inch in size.
- D. Bedding material shall be provided from offsite unless the trench passes through a well-defined strata of sand or gravel. Bedding material shall be subject to the approval of the ENGINEER.
- E. Stone material shall meet the requirements of Section 902.03 of the MDOT Standard Specifications for

Construction for 6A crushed Coarse Aggregate or approved equal.

4. BACKFILL

A. Job Excavated Backfill

Job excavated backfill shall be defined as material excavated from the site that is free from frozen earth, boulders, rocks, stones larger than 3-inch in size, debris, blue and gray clay, and organic material.

B. Granular Backfill

Granular backfill shall be defined as sharp sand, gravel, or crushed stone that is free from lumps of clay and soft or flaky material and shall conform to the latest MDOT Specification for Granular Material Class II or III. Granular backfill shall be used for fill work located under or within the influence of roadway surfaces. The Owner's standard details shall dictate which type of granular material (class II or III) is required for the project.

Material excavated from the trench may be used as granular backfill when, in the opinion of the ENGINEER, it meets the granular backfill grading requirements.

5. STONE REFILL

Stone refill shall consist of natural gravel, slag, or crushed gravel that is equivalent in gradation to MDOT 6A unless otherwise called for in the plan details.

6. EMBANKMENT

Embankment material shall consist of sound earth as described in Section 205.03H of the MDOT Standard Specifications for Construction.

CONSTRUCTION

7. CLEARING

Prior to the start of construction, the CONTRACTOR shall verify the limits of trees and other items that are to be saved. The CONTRACTOR shall then clear the site or trench excavation area of all remaining trees, brush, and other miscellaneous items that are not to be saved.

8. TREE REMOVAL

Where called for on the plans, the CONTRACTOR shall remove trees, including stump and main roots, and dispose of all associated foliage and debris offsite. Trees less than six (6) inch diameter shall be removed where required by the Work as incidental to the Contract. The CONTRACTOR shall abide by any easement agreements regarding the tree removal work and wood ownership.

9. STUMP REMOVAL

Where called for on the plans, the CONTRACTOR shall remove existing stumps, including main roots (two (2) inch diameter and larger), dispose of all associated debris offsite, and backfill the void with suitable material.

10. PAVEMENT CUTS

Where a trench must be cut through pavement, driveway, or sidewalk, particular care shall be taken to avoid unnecessary damage to adjoining areas of the pavement, driveway or sidewalk. All cuts through existing surfaces shall be made full-depth with a concrete saw. Cuts in concrete pavement shall be made parallel with longitudinal and transverse construction or contraction joints.

Saw cuts in concrete pavement shall not be nearer than five feet (5'-0") to a transverse joint, to the centerline of pavement, or to the edge of pavement or curb, i.e., no existing or replacement pavement shall be less than five feet (5'-0") in width. If the damaged pavement or surfacing is nearer than five feet (5'-0") to a joint or centerline of

pavement, or to edge of pavement, surfacing or curb, removal and replacement shall be extended to said joint, centerline, edge of pavement, surfacing, or curb. These same requirements shall apply to the saw cutting and replacement of concrete driveways.

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

11. CLASSIFICATION OF EXCAVATION

Earth, as a name for excavated material, shall include all glacial deposits whether cemented or not, except solid boulders one-half cubic yard or more in volume. It shall also include all alluvial deposits and material of every kind that can be excavated with equal facility by the equipment and means typically used for earth excavation.

Peat, as a name for excavated material, shall include all unstable organic soils such as peat, muck, marl, and underlying very soft clay.

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

12. ROADWAY EARTHWORK

Roadway earthwork shall be performed in accordance with the construction methods that are described in Section 205 of the MDOT Standard Specifications for Construction unless otherwise called for in

the plan notes, details, or supplemental specifications.

13. METHODS OF EXCAVATION IN EARTH

All excavation shall be by open cut from the surface, except in special cases where boring/jacking under pavement or structures may be required, or where boring/jacking under the root system will be required for tree root protection. All excavation shall be made in such a manner and to such depth, length, and width as will give ample room for building the structures, bracing, sheeting and supporting the sides of the excavation, pumping and drainage of ground water and sewage which may be encountered, and removal of all materials excavated. Special care shall be taken so that the soil below the bottom of structures to be built shall be left undisturbed so that a firm bed will be provided for construction. Any voids shall be backfilled with suitable granular material and shall be properly compacted.

14. TRENCH EXCAVATION

A. General

Excavation shall be of sufficient width and depth to provide adequate room for construction and installation of the work to the lines, grades and dimensions called for on the plans. Unless otherwise called for on the OWNER's standard details, the width of a trench from the invert to a height twelve (12) inches above the top of the pipe barrel shall be indicated as follows:

Pipe Size	Maximum Trench Width
4" through 12"	30"
Larger than 12"	O.D. + 24"

If the maximum trench width as specified above is exceeded, unless otherwise shown on the drawings, the CONTRACTOR shall install, at his own expense, such concrete

cradling or other bedding as is approved by the ENGINEER, to support the added load of the backfill.

Where trench excavation is in granular material, the last six (6) inches of trench depth shall be carefully excavated and trimmed by hand to the exact elevation and contour of pipe. Where trench excavation is in rock or clay soil, the trench bottom shall be undercut a minimum of four (4) inches below the final elevation of pipe. The bedding material as hereinafter specified shall be placed and compacted to the underside of the pipe.

Excavation for structures shall be made to the outside lines and surfaces of such structures wherever it is practicable to build directly against the sides and bottoms of excavations. In such cases, care shall be taken not to disturb the original foundation or backing. Final trimming shall be done by hand just before construction of the structure. If excess excavation is made, or the material becomes disturbed so as to require removal beyond the prescribed limits, the resulting space shall be refilled with bedding, as specified hereinafter, and solidly machine tamped into place to 95 percent of maximum unit weight before the construction work proceeds.

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

B. Bedding

Where the subgrade below the bottom of the pipe is disturbed during the construction, the space shall be refilled with sand or pea gravel bedding material solidly tamped to form a firm foundation for the pipe. Sand or pea gravel bedding material shall be extended to one (1) foot above the pipe, except that the bedding shall be exclusively pea gravel to the springline for pipe 36-inch and greater in diameter.

C. Amount of Trench Opening

Not more than 50 feet of trench shall be open at one time in advance of the pipe unless permitted by the ENGINEER. The length of street that may be occupied by the construction work at any one time shall be subject to the direction of the ENGINEER and will be based on requirements of the use of the street by the public. No more than 600 consecutive feet of street length shall be occupied at one time, and vehicle traffic through the street shall not be entirely stopped without permission of the ENGINEER.

After placement of the utility line, the Contractor shall backfill the trench promptly in order to minimize the length of open trench and avoid any unsafe conditions.

15. TRANSPORT OF NATIVE MATERIALS OFFSITE

If the Contractor encounters good materials (sand, gravel, topsoil, etc.) during the course of construction, he shall not be allowed to transport these materials offsite without the written approval of the Engineer. Wherever possible, suitable native sands and gravels shall be used as backfill rather than transporting them offsite and replacing them with non-native materials of a lesser quality.

16. STONE REFILL FOR TRENCH UNDERCUT

In locations where soil at the bottom of trench is unstable, the CONTRACTOR shall excavate (undercut) below the trench bottom and place stone refill as called for in the Materials Section of this specification.

17. EXCAVATION & TRENCH DEWATERING

The CONTRACTOR shall maintain any excavation or trench free of water during construction of any structures and/or pipelines. Water accumulated due to rainfall or runoff and minor groundwater inflow that

can be controlled through the use of portable trash, submersible or positive displacement pumps shall be considered normally expected and anticipated conditions associated with underground construction. This effort will be considered incidental to the cost of construction and will not be reimbursable at the unit price bid for dewatering in the proposal.

The required use of deep wells and/or well points to lower and maintain a reduction in the groundwater elevation below the trench bottom shall be subject to approval of the ENGINEER and shall constitute a reimbursable expense for trench or excavation dewatering. If a pay item for dewatering is included in the Bid Form, then the CONTRACTOR would receive payment for this work based upon the unit bid price. If there are no provisions in the contract for payment for dewatering (i.e. bid item or incidental to other pay items), then the CONTRACTOR shall submit a detailed estimate of the additional cost. Upon acceptance of the CONTRACTOR's estimate, the ENGINEER shall issue a change order. The CONTRACTOR must demonstrate that a continuous effort is required to control hydrostatic pressure in the construction area in order to claim compensation for dewatering.

The CONTRACTOR shall take adequate precautions to control the discharge of dewatering pumps so as to prevent soil erosion or sedimentation of drainage ditches, structures, storm sewers, culverts, natural drainage courses, ponds, lakes or wetlands.

The CONTRACTOR shall insure that discharge from any dewatering operations has a suitable outlet and that it will not cause any damage to adjacent dwellings or property. Water and discharge hoses shall be placed and/or controlled so as to prevent a hazard to pedestrians or motor vehicles passing in the vicinity of the construction site.

Electric pumps shall have suitable power supply appurtenances meeting NEC requirements and properly fused and grounded to prevent electrical shock hazards to on-site personnel.

Internal combustion engine driven pumps, if operated 24 hours per day, shall have adequate exhaust silencers in good repair to muffle engine noise to an acceptable level for the area where located.

18. DIVERTING EXISTING SEWERS

Where existing sewers or drains are encountered in the Work, adequate provision shall be made for diverting flow in the existing sewers so that the excavation will be kept dry during the progress of the construction work. Upon completion of the construction work, the existing sewers shall be restored or otherwise provided with an adequate outlet as directed by the ENGINEER.

19. SHEETING, BRACING & SHORING

Where required to properly support the surfaces of excavations to protect the construction work, adjacent work or workers, sheeting, bracing and shoring shall be provided. If the ENGINEER is of the opinion that at any point sufficient or proper supports have not been provided, he may order such additional supports at the expense of the CONTRACTOR, but neither the placing of such additional supports by the order of the ENGINEER nor failure of the ENGINEER to order such additional supports placed shall release the CONTRACTOR from his responsibility for the sufficiency of such supports and the integrity of the Work. In removing the sheeting and bracing after the construction has been completed, special care shall be taken to prevent any caving of the sides of the excavation and injury to the completed work or to the adjacent property.

20. SHEETING LEFT IN PLACE

Sheeting, bracing and shoring shall not be left in place after completion of the work except as required by the ENGINEER. Where sheeting, bracing, and shoring must be left in place in order to protect the work, adjacent structures, or property, it shall be cut off or left not less than two (2) feet below the established surface grade. If sheeting, shoring or bracing must be left in place, then it shall be paid for at the contract unit bid price that is shown on the Bid Form. If a pay item was not included on the Bid Form, then a work order shall be negotiated.

21. CROSSING EXISTING STRUCTURES/PIPES

During construction, it may be necessary to cross under certain sewers, drains, culverts, water lines, gas lines, electric conduits and other underground structures. Every effort shall be made to prevent damage to such structures. Wherever such structures are disturbed or broken, they shall be restored to good condition. Specified granular backfill shall be placed as described in Section 23, Backfilling. MDOT Grade S3 concrete shall be utilized where directed by the ENGINEER at no additional cost to the project. Either granular backfill or concrete shall be brought to the spring line of the higher utility.

22. TUNNELING TREES

Trees eight (8) inches in diameter or less will require a minimum tunnel length of eight (8) feet. Trees over eight (8) inches in diameter, measured four (4) feet above the ground surface, will require a minimum tunnel length equal to one foot for each inch of tree diameter.

Trees shall be tunneled whenever any portion of an excavation approaches within a distance equal to one-half the required tunnel length except as otherwise noted on the plans.

Tunneling under trees may be accomplished by one of the following methods:

- a. Boring and jacking casing pipe along with placement of a carrier pipe.
- b. Boring and jacking sewer pipe or water main without a casing pipe.
- c. Jacking sewer pipe or water main without boring and without a casing pipe.

Plan notes or existing field conditions shall indicate which method may be used for the tree tunneling work.

23. BACKFILLING

A. General

Backfilling shall include all work required as hereinafter specified. The placement of various pipe, including bedding and building of structures, shall be completed prior to backfilling.

Where called for on the plans, the CONTRACTOR shall backfill trenches and/or other excavations with suitable excavated material (not including gray or blue clay) replaced into the trench or excavation and compacted to not less than 95 percent of maximum unit weight as determined at existing moisture content during backfilling. Compaction shall be provided by means of suitable mechanical compaction equipment.

If the moisture content of cohesive backfill material exceeds the optimum moisture content for maximum density by more than three percent (3%), the CONTRACTOR shall dry the material to meet the foregoing moisture content limitation or provide, at his own expense, MDOT Granular Material Class III. No sloppy or wet backfill will be allowed.

Maximum unit weight will be determined by current methods of Test for Compaction and Density of Soil, AASHTO Designation T-180 or by the Cone Density Method

developed by MDOT, as the material may require.

The ENGINEER shall make compaction tests at all locations requiring granular backfill.

Any depression resulting from settlement of any backfill prior to the date of final payment for all work under this contract shall be brought to the proper grade and surface and made to match the adjacent surface.

B. Materials

Bedding, excavated backfill, and granular backfill shall conform to the requirements that were previously described in Parts 3 and 4 of this specification.

C. Compaction

Backfill material shall be placed in layers not to exceed 12 inches in thickness unless the contractor can demonstrate to the satisfaction of the Engineer that he can consistently attain the specified density on thicker lifts.

Specified compaction shall be obtained with the use of a bulldozer, sheepsfoot roller, mechanical tamper or other similar and effective equipment. Specified compaction means not less than 95 percent (not average 95 percent) of maximum unit weight when tested in accordance with current MDOT Specifications.

If excavated material is not suitable to obtain 95 percent minimum compaction, the CONTRACTOR shall, at his expense, remove unsuitable materials or add granular materials, or both, to obtain ninety-five percent (95%) minimum compaction as specified.

Compaction tests will be made by a representative of the OWNER and paid for by the OWNER, unless otherwise specified in the Contract Documents.

D. Backfilling Trenches

Bedding

The type of bedding required is shown on the detail drawings.

Bedding shall be worked under the haunches of the pipe to provide firm continuous support.

Bedding placed on the sides of and above the pipe shall be compacted by machine tamping to not less than ninety-five percent (95%) of maximum unit weight in layers not exceeding 12 inches in depth.

Trench or Excavated Area

All trenches in paved streets, shoulders, traveled roadways, parking areas and driveways shall be backfilled with suitable excavated backfill or granular backfill, as shown on the drawings from one (1) foot above top of pipe up to the required subgrade elevation which will allow for placement of the required gravel base and/or pavement surface. The approved excavated backfill or granular backfill shall be placed and thoroughly and uniformly compacted by machine tamping to the specified compaction. With the approval of the ENGINEER, water jetting may be accepted in lieu of tamping for granular backfill only.

Specified compaction shall be required of the entire trench when the edge of trench is within three (3) feet of edge of pavement. On road crossings, specified compaction shall extend ten (10) feet beyond the edge of pavement for paved roadways with gravel shoulders or shall extend three (3) feet beyond the back of curb for roadways with curb.

Trenches under concrete sidewalks and bike paths shall be backfilled from one foot above top of pipe to a level four (4) inches below finished grade of the sidewalk with approved suitable excavated backfill or

granular backfill and compacted to ninety-five percent (95%) maximum density.

Trenches not in paved streets, shoulders, traveled roadways, parking areas, driveways or under sidewalks, shall be backfilled from one (1) foot above the top of the pipe up to the ground surface (except as noted under the Restoration Specification) with suitable excavated backfill and shall require compaction equal to adjacent undisturbed earth.

Wherever gas mains, water mains, sewers, or other utilities are located in the trench area, granular backfill shall be used for backfill from bottom of the trench up to the springline of the pipes. Granular backfill shall be placed across the full trench width and extend far enough either side of the existing pipe to allow specified compaction so as to thoroughly support the pipe within the trench area.

E. Backfilling Around Structures

As soon as practicable after concrete structures have set, forms and debris shall be removed and the surface of the concrete pointed. After the structure has been checked and approved, the excavated area around the structure shall be backfilled up to specified subgrade with granular material or suitable excavated material as called for on the drawings for the adjacent trench. The fill shall be thoroughly compacted by machine tamping. No large boulders or masonry shall be placed in backfill. No backfill will be placed against manhole walls within 48 hours after the plaster coat has been applied to the outside of the walls nor shall backfill be placed about concrete structures until concrete has attained at least 75 percent of its design strength and approval of the ENGINEER has been obtained.

24. PLACING AND COMPACTING EMBANKMENT

Embankment material for fill work shall be placed and compacted in accordance with

Section 2.05.03H of the MDOT Standard Specification for Construction.

25. DISPOSAL OF EXCAVATED MATERIAL

After all suitable excavated material has been used on site, the CONTRACTOR shall be responsible for properly removing and disposing of the excess.

The CONTRACTOR shall also be responsible for disposing of all other excavated materials that are unsuitable for use as fill or backfill. Unsuitable materials may include, but are not limited to, broken concrete, asphalt, rock, stone, and other related debris. The CONTRACTOR shall be required to obtain his own disposal areas and permits and shall receive no additional compensation for this disposal work.

Surplus or unsuitable material shall not be disposed of either temporarily or permanently beyond the plan grading limit line or across any wetland or flood plain unless the plans provide for such placement.

Any agreements that the CONTRACTOR makes with local residents concerning the placement of fill on private property shall be the sole responsibility of the CONTRACTOR. The OWNER will not become involved with any such agreements and will not be liable for damages that the CONTRACTOR may cause to private property.

Placement of fill on private property may require that the resident or CONTRACTOR obtain a grading permit or fill permit from the OWNER.

26. FINAL CLEANUP & GRADING

Upon completion of the construction, and before final payment is made, the CONTRACTOR shall restore his working area to as clean a condition as existed before his operations were started. He shall go over the entire line and refill any place that may

have settled. He shall then re-grade and put in shape all backfilled trenches, all fills he may have made from excess excavated materials, and all other areas that may have been disturbed through all operations.

27. CONTRACTOR SAFETY REQUIREMENTS

The excavation and trenching operations shall be conducted by the CONTRACTOR in a manner that will provide safe working conditions for all persons on the site who may be affected by the Work. The CONTRACTOR shall also conduct his operations in a manner that will protect adjacent property from damage.

Trench sides shall be either cut back to the slope as necessitated by soil and ground water conditions which will provide stable sides, or supporting systems shall be installed that are capable of restraining the earth sides from movement. A qualified employee of the CONTRACTOR shall design the trench supporting systems.

The CONTRACTOR shall employ, at all times at the site of the work, a qualified person who will be responsible for the safety of both the work and workmen, and who will make all the decisions relevant to the stability of trenches, the adequacy of any and all protective devices, proper operation of equipment, and all other matters related to safety.

The CONTRACTOR shall not store, along and adjacent to the trench, excavated material, heavy equipment, backfill materials, sewer pipe, or other construction materials which may impose too great a load on the earth and cause displacement or caving of the earth. The CONTRACTOR shall, at all times, provide a safe means of emergency exit from all trench excavations.

End of Section

STORM SEWER CONSTRUCTION

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GENERAL

1. SCOPE OF WORK

This work shall be subject to the requirements of the General Conditions and General Specifications and shall include the furnishing of all labor, materials, tools, equipment, accessories and services necessary for providing and installing the items as shown on the Contract Documents or as herein required.

In the event these Specifications conflict with those of the OWNER's standards, the permit agency, or agency controlling the right-of-way where the sewer is being installed, the more stringent requirements will govern.

2. SHOP DRAWINGS

When required by the ENGINEER, shop drawings shall be furnished as prescribed under the General Conditions.

Before the CONTRACTOR orders any pipe or other appurtenances that he is proposing to use as substitutes for specified items, he shall submit design details of the substitutes to the ENGINEER for consideration and approval.

3. CERTIFICATION & CHECKING

All pipe and precast structures delivered to the job shall be accompanied by certification papers showing they have been tested in accordance with applicable specifications and that they meet the specifications for the project. All pipes and precast structures will be checked upon delivery to the job site. Any cracked, damaged or broken pieces or sections will be immediately removed from the site at the CONTRACTOR's expense.

4. MDOT STANDARDS

References to the Michigan Department of Transportation (MDOT) Specifications shall pertain to the 2012 Standard Specifications for Construction.

MATERIALS

5. SEWER PIPE

Sewer pipe shall be of the type and class designated for the specific locations or intended use shown or noted on the project plans. Any deviation from the type or class of pipe shown on the plans will not be permitted except upon receipt of written approval of the ENGINEER.

Any of the types of storm sewer pipe or joints listed below may be substituted upon approval of the ENGINEER provided that the flow capability and pipe strength (external load supporting) is equal to or exceeds that of the pipe specified on the plans.

Table ST-1
Storm Sewer Pipe Specifications

The intent of this table is to show the standards required for particular types of pipe and joints. The OWNER may not accept all of these types. The CONTRACTOR must refer to the project plans OWNER's standard details and bid forms to determine the type of pipe required for a particular project.

	<u>Type of Pipe</u>	<u>Pipe Specification*</u>	<u>Allowable Type of Joint</u>	<u>Joint Specification *</u>
a.	Extra strength non-reinforced concrete	ASTM C14	Modified grooved tongue with rubber gasket	ASTM C443
b.	Reinforced round concrete (size 12" & larger)	ASTM C76	Modified grooved tongue with rubber gasket	ASTM C443
c.	Reinforced elliptical concrete	ASTM C507	Tongue & grooved bituminous sealed joint with inside cement pointing on 42" equivalent size and larger External Seal (can be added to tongue and grooved bituminous sealed joint)	ASTM C443 ASTM C877
d.	Corrugated and smooth round metal pipe & pipe arch (galvanized steel)	AASHTO M36 ASTM A760	Metal coupling bands	AASHTO M36
e.	Corrugated and smooth round metal pipe & pipe arch (aluminized steel type 2)	AASHTO M36 ASTM A760	Metal coupling bands	AASHTO M36
f.	PVC (corrugated pipe with smooth interior; size 36" & smaller)	ASTM F949	Push on type	ASTM D3212 ASTM F477

	Type of Pipe	Pipe Specification*	Allowable Type of Joint	Joint Specification *
g.	HDPE	AASHTO M294 ASTM F2306	Push on type	ASTM D3212 ASTM F477
h.	PVC underdrain – smooth wall (4" & 6")	AASHTO M278	Push on type	* *
i.	ABS underdrain – smooth wall (4" & 6")	ASTM D2751, SDR 35 (AASHTO M270 for perforations)	Push on type	* *
j.	Polyethylene underdrain – corrugated (4" & 6")	AASHTO M252	Coupling band	AASHTO M252
k.	PVC underdrain – corrugated (4" & 6")	ASTM F949 (AASHTO M252 for perforations)	Coupling band	ASTM F949

* The latest revision of ASTM or AASHTO Specifications shall apply.

* * Joint tightness requirements shall not apply.

ASTM stands for American Society of Testing and Materials

AASHTO stands for American Association of State Highway Transportation Officials

6. CEMENT MORTAR POINTING:

Non-shrink cement mortar shall conform to MDOT Standard Specifications for Construction Type R-2 Mortar.

in-place concrete, or combinations of above. Structures shall be constructed to conform to these specifications and in accordance with the plan details. Where references are made to ASTM or AASHTO Specifications, the latest revision shall apply.

7. STORM DRAINAGE STRUCTURES

Manholes, catch basins, inlets, and special structures shall be constructed at locations shown on the plans and shall be of the size and type called for on the plans. They shall be constructed of precast reinforced concrete, concrete manhole block, poured-

- a. Precast reinforced concrete manhole sections shall conform to ASTM C478. The minimum wall thickness for four (4) foot diameter manholes shall be five (5) inches.

- b. Precast manhole tees for 48-inch and larger storm sewer pipes shall be the same class pipe as that specified on the plans, but shall be a minimum ASTM C76 Class IV. The manhole riser shall meet the requirements of ASTM C478.
- c. Joints on precast reinforced concrete risers, cones, and base sections may be either cold applied bituminous mastic or modified grooved tongue with rubber gasket conforming to ASTM C443.
- d. Base slab for structures shall be precast reinforced concrete, ASTM C478. When approved by the ENGINEER, poured in place concrete may be used. Base riser section with integral floor design shall be approved by the ENGINEER prior to manufacture.
- e. Manhole steps shall be reinforced polypropylene plastic No. PS2-PFS as manufactured by M.A. Industries, Inc., cast iron No. 8500 as manufactured by East Jordan Iron Works, approved equal, or as specified on the drawings.
- f. Concrete manhole block shall conform to ASTM C139 and additional requirements of MDOT Specification 913.05.
- g. Brick for use in drainage structures shall conform to MDOT Specifications 913.03 A and C (concrete bricks).
- h. Grade rings shall conform to ASTM C478 and shall have minimum thickness of three (3) inches.
- i. Mortar for use in drainage structures shall conform to MDOT Specification 702, Type R-2.
- j. Concrete for poured-in-place construction shall conform to plan details, approved shop drawings, and to the requirements of grade S3 concrete as shown in the MDOT Specifications Table 701-1A Concrete Structure

Mixtures by Slump and Table 701-1B Concrete Structure Mixtures by Strength of Concrete.

- k. Gray iron castings shall be of the type, size, and weight as specified on the plans. The castings shall conform to MDOT Specification 908.05.
- l. The entire outside surface of all brick or concrete block portions of drainage structures shall be plaster coated with one-half (1/2) inch thick mortar.
- m. All manholes on storm sewers eighteen (18) inches in diameter and smaller shall have two foot deep sumps unless otherwise called for on the plans

CONSTRUCTION

8. GENERAL

Excavation, bedding, and backfill for sewers and related structures shall be accomplished in accordance with requirements in the Earthwork Section.

Excavations shall be of sufficient widths and depths to provide adequate room for the construction and installation of the work to the lines, grades, and dimensions called for on the plans.

If the maximum trench width specified in the Earthwork Section is exceeded (unless otherwise shown on the plans), the CONTRACTOR shall install, at his own expense, such concrete cradling or other bedding as approved by the ENGINEER to support the added load of the backfill.

Install pipe, fittings, and appurtenances in strict accordance with the manufacturer's recommendations and these Specifications.

9. LAYING PIPE

- a. Handling Pipe & Fittings

All pipes and castings shall be unloaded and distributed along the line of work in such manner and with such care as will effectually avoid damage to any pipe or fitting. Dropping pipe or fittings directly from the truck will not be permitted. Care must also be taken to prevent abrasion of the pipe.

b. Placement of Pipe

Each pipe shall be checked for defects prior to being lowered into the trench. The inside of the pipe and the outside of the spigot shall be cleaned of any dirt or foreign matter.

Construction shall begin at the outlet end and proceed upgrade with spigot ends pointing in the direction of flow. Pipes shall be laid on a minimum four (4) inch sand bedding. A six (6) inch sand bedding shall be provided if called for on the plan details. If the subgrade has been disturbed so that refilling is necessary to bring the pipe to grade, such refilling shall be done with sand or gravel thoroughly tamped in place. Bell holes shall be excavated so that the full length of the pipe barrel will bear uniformly on the sand bedding.

Pipes shall be centered in bells or grooves and pushed tight together to form a smooth and continuous invert. After laying pipe, care shall be taken so as not to disturb its line and grade. Any pipe found off grade or out of line shall be re-laid properly by the CONTRACTOR.

c. Line and Grade

All pipe shall be laid to line and grade called for on the plans. Each pipe, as laid, shall be checked by the CONTRACTOR with line and grade pole or other device to insure this result is obtained. The finished work shall be straight and shall be sighted through the pipe between manholes.

d. Excavation to 18 inches Below Bottom of Pipe

As a result of the CONTRACTOR's construction procedure or where excavation has not uncovered a stable foundation subgrade at a depth of six (6) inches below the bottom of pipe, the CONTRACTOR shall continue to excavate downward to a maximum distance of eighteen (18) inches below the bottom of pipe to reach stable foundation soil. The space resulting from such excavation and the pipe bedding shall be filled and constructed in the same manner and using the same materials specified in the Earthwork Specifications Section. All costs for such construction shall be borne by the CONTRACTOR.

e. Excavation Below Limits Specified in above Paragraph "d"

Where excavation has not uncovered a stable, foundation subgrade at depths eighteen (18) inches below the bottom of pipe, then the CONTRACTOR shall stop further excavation and immediately notify the ENGINEER of the condition and of his intent to make a claim for additional cost. The ENGINEER shall investigate the soil conditions and may direct the CONTRACTOR to continue excavating if it appears that a stable subgrade can be obtained. In this case, the additional excavation beyond eighteen (18) below the bottom of pipe would be measured and paid for as trench undercut and refill. Material for refill of the undercut area shall be as described in the Earthwork Section. In the event that soil conditions are extremely severe, then the ENGINEER and soils consultant shall investigate the site conditions and shall prescribe the appropriate pipe support system to be used. Within ten (10) days after the ENGINEER determines the appropriate pipe support system to be used, the CONTRACTOR shall submit a detailed estimate for additional cost, excluding the costs to be borne by the CONTRACTOR in the above paragraph "d". The estimate shall include only those additional costs necessary to construct the pipe support system as directed by the ENGINEER. It shall not include

construction costs prior to the stoppage of work. Upon acceptance of the CONTRACTOR's estimate, the ENGINEER shall issue a change order. Laying and Bedding of PVC and HDPE Pipe

Bedding of PVC and HDPE Pipe shall be in accordance with current ASTM specifications.

Potential damage can occur to exterior walls of PVC and HDPE Pipe, particularly under cold weather conditions if rocks, frozen material, or large objects strike the pipe. The CONTRACTOR shall carefully avoid dumping any materials other than approved bedding sand or stone on the pipe until a 12-inch cover is placed on it. Pipe walls and joints shall also be protected from abrasion and damage during handling and shall be fully checked just prior to placing in the trench.

Care shall be taken during bedding compaction to avoid distorting the shape of the pipe or damaging its exterior wall.

Cutting of pipe, where required, shall be performed by the use of tools or equipment that will provide a neat, perpendicular cut without damage to the pipe material.

Bowing or warping of pipe can occur with temperature fluctuations. The CONTRACTOR shall store and protect the pipe to minimize bowing. Nominal 12'-6" pipe lengths that have deviations from straight greater than one (1) inch shall not be used.

f. Concrete Cradle for Pipe

Where called for on the drawings, or otherwise required, pipe shall be installed with a concrete cradle of MDOT Grade S3 concrete.

Each pipe shall rest on a 6-inch minimum thickness bed of dry mix concrete that is shaped to fit the bottom of the pipe. The dry

mix concrete shall be MDOT Grade S3 or ENGINEER-approved equal.

After setting the pipe, the space between the outside of the pipe and the undisturbed trench bank shall be filled to a level equal to a point 1/3 of the diameter above the pipe invert with MDOT Grade S3. The concrete shall have a five (5) inch slump and be mechanically vibrated to insure complete filling of the annular space between the excavated face of the original ground and the outside face of the pipe.

g. Jointing

Where pipe is laid in wet trenches, trenches with running sand, or in trench conditions where manual means will not allow pushing the pipe home, the CONTRACTOR shall provide and use mechanical means for pulling the pipe home and holding the pipe joints tight until completion of the line. Mechanical means shall consist of a cable placed inside the pipe with a suitable winch, jack, or come-along for pulling the pipe home and holding the pipe in position.

All joints on elliptical concrete pipe (42-inch equivalent diameter and larger) shall be cement mortar pointed on the inside. On bituminous mastic joints the compound shall be removed to a depth of three-quarters (3/4) of an inch from the inside of the joint before pointing.

h. Backfill

Backfill shall be placed in accordance with the Earthwork Specifications.

10. STORM DRAINAGE STRUCTURES

Construction methods for drainage structures shall conform to MDOT Specification 403.03 except as herein provided.

All precast sections shall bear the stamp of an approved laboratory as having been tested and delivered from tested stock of the

manufacturer, at the expense of the CONTRACTOR.

Precast sections shall be constructed so that no more than fifty (50) percent of the circumference, measured on the inside face, is deleted on any horizontal plane for sewer pipe openings. There shall be no less than twelve (12) inches of residual concrete measured on any horizontal plane between pipe openings.

Excavation shall be carried to the depth required to permit the construction of the base in accordance with the requirements of the Standard Details. The excavation shall be sufficiently wide to allow for shoring, bracing, or formwork, should any or all be necessary. Also, the excavation shall allow for accessibility in plastering the exterior of all brick masonry. The bottom of the excavation shall be trimmed to a uniform horizontal bed to receive the concrete base. The excavated section shall be completely dewatered before any concrete is placed therein.

With the exception of drainage structures having sumps, the bottom of the structures shall be channeled to provide for smooth flow through the manhole. Channels shall be formed using MDOT Grade S3 concrete.

Connections to manholes shall be properly supported and braced where not resting on original ground so that any settlement will not disturb the connection.

11. FINAL GRADE ADJUSTMENTS

a. Final Grade – Existing Structures

Adjustment of drainage structures shall apply to all final vertical changes made on existing structures where the elevation of the cover is not changed by more than six inches. Vertical changes in excess of six (6) inches will be treated as structure reconstruction.

b. Final Grade – New Structures

Final grade adjustment of new structures shall be considered as incidental to the structure construction.

Final grade adjustments may be made using either brick and mortar construction or precast concrete adjustment rings at the option of the CONTRACTOR.

The maximum allowable grade adjustment using grade rings shall be fifteen (15) inches. Final grade adjustment for manholes located in pavements and sidewalks shall be made with brick and mortar. A minimum of three (3) or maximum of six (6) courses of brick shall be placed on top of the precast cone section.

12. STUBS, CONNECTIONS, AND BULKHEADS

The CONTRACTOR shall furnish all material and labor and shall install and/or construct stubs, connections, bulkheads, and related items of work as called for in the Contract Documents.

Existing sewers shall be connected where called for on the plans. Bulkheads shall be placed or removed where called for on the plans.

Unless otherwise noted on the plans, stubs twelve (12) inches or larger in diameter shall consist of one full length of concrete storm sewer pipe, minimum length eight (8) feet, with watertight brick and mortar bulkhead. Unless otherwise noted on the plans, stubs four inches (4-inch) to ten inches (10-inch) in diameter shall consist of one full length of plastic storm sewer pipe, minimum length of eight (8) feet, with an expandable plug or removable cap.

13. CLEANING

All sewers shall be thoroughly cleaned before final acceptance.

14. TESTING

a. General

The CONTRACTOR shall provide all necessary equipment and labor for making the tests and cost of same shall be incidental to the unit price bid for sewer.

CONTRACTOR shall correct the conditions at his own cost and shall re-videotape the affected pipe sections for review by the ENGINEER.

End of Section

b. Deflection Test for Plastic Pipe

The allowable maximum deflection shall be five (5) percent of internal pipe diameter. A Deflection Test Gauge (Go, No-Go) as manufactured by Hurco Technologies, Cherne Industries, or approved equal shall be used to verify that the maximum allowable deflection standard is met. The test gauge must have a minimum of 9 points. Proving rings must be provided to verify the gauge diameter. The gauge must be pulled through manually. Force will not be allowed. Pipe with deflections greater than five (5) percent will be considered unacceptable and shall be replaced by the CONTRACTOR at his own cost.

c. Videotaping

As a means of insuring that pipe laying was properly done and that all joints are in a "home" position, the CONTRACTOR shall provide for videotaping of ten (10) percent of the pipe footage laid (pipe 36" diameter and smaller), with no less than one manhole run being televised on each project. The ENGINEER shall indicate which pipe runs are to be videotaped. The videotaping shall be done no sooner than thirty (30) days after sewer installation is complete. The CONTRACTOR shall provide twenty-four (24) hours notice to both the OWNER and ENGINEER prior to videotaping so that a representative may be present. A satisfactory review of the videotape by the ENGINEER shall be a condition for sewer acceptance by the OWNER. Typical items to be reviewed on the videotape will include pipe deflection, pipe settlement, connections, joints and pipe cleanliness. If the videotape review reveals unsatisfactory conditions, the

WATER MAIN CONSTRUCTION

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GENERAL

1. SCOPE OF WORK

This work shall be subject to the requirements of the General Conditions and General Specifications and shall include the furnishing all labor, materials, tools, equipment, accessories, and services necessary for providing and installing the items as shown on the Contract Documents or as herein required.

This work shall consist of furnishing and installing water mains, valves, hydrants, and connections, of size and character and at locations shown on the plans, and shall include excavation, bedding, backfill, testing and sterilization.

The CONTRACTOR shall set crosses, tees, bends, sleeves, and other special fittings in the main where shown on the plans or as directed by the ENGINEER. All unconnected openings of such special fittings shall be closed by standard plugs. All special fittings shall be incidental to water main construction unless otherwise specified in the Contract Documents.

2. AGENCY STANDARDS

In addition to the requirements and specifications hereinafter listed, all materials and methods for water main construction in all areas served by the Detroit Water and Sewerage Department (DWSD) shall conform to the standards of said Department. For those areas not served by DWSD, then the appropriate controlling agency standards shall apply.

In the event that these specifications are in conflict with those of DWSD or other agencies, then the more stringent specifications shall prevail.

3. SHOP DRAWINGS

When required by the ENGINEER, shop drawings shall be furnished as prescribed under the General Conditions.

Before the CONTRACTOR orders any pipe or other appurtenances that he is proposing to use as substitutes for specified items, he shall submit design details of the substitutes to the ENGINEER for consideration and approval.

4. CERTIFICATION & CHECKING

All pipe and fittings delivered to the job shall be accompanied by certification papers showing that pipe and fittings have been tested in accordance with the applicable specifications and that pipe and fittings meet the specifications for this project. All pipe and fittings will be checked upon delivery to the job site. No cracked, broken or damaged pipe or fitting will be allowed in this work. Rejected pipe and fittings will be immediately removed from the job site by the CONTRACTOR at his expense.

Each piece of ductile iron pipe shall have its own weight and class designation conspicuously painted or cast on it. All other pipe materials shall have the class designation painted thereon. Where required, other designation marks shall be painted on the pipe or fittings to indicate correct location in the pipe line in conformity to a detailed laying schedule.

MATERIALS

5. GENERAL

The general requirements for types of pipe, fittings, and joints for water mains are specified below. The specific requirements for the various allowable types of pipe, valves, hydrants, and fittings shall be as listed in the OWNER's utility standards summary. All pipe shall be clear inside diameters not less than the dimensions shown on the plans.

6. VALVES

a. General

Valves shall be furnished and installed at locations shown on the plans. Valves sixteen (16) inch in diameter and smaller shall be gate valves. Valves larger than sixteen (16) inches in diameter shall be butterfly valves unless otherwise called for on the plans.

b. Gate Valves

Gate valves shall be manufactured in conformance with the applicable requirements of American Water Works Association (AWWA) C500, C509 and C515 latest revised editions.

The valves shall be of ductile iron body, fully bronze mounted, with bronze stems. The valves shall have double disc with parallel seats and discs or be of the resilient wedge type as specified by the OWNER's standards. Valves shall be non-rising stem type, arranged with two-inch square nuts for key operation. Stuffing boxes shall be equipped with two "O" rings on the stem located above the thrust collar. These O-rings must be replaceable while the system is under pressure.

All parts of the double disks shall be made of bronze or other approved corrosion-resistant metal. Resilient wedge valves shall be of a rubber encapsulated ductile iron wedge design. Wedges shall be rubber encapsulated per ASTM-D429. All parts of the valves which affect opening-closing of the mechanism shall be in accordance with the American Water Works Association Standard. Bolts used in the gate valve assembly shall be of stainless steel.

c. Butterfly Valves

Butterfly valves shall be manufactured in conformance with requirements of AWWA Standard C504, latest edition thereof. Butterfly valves shall be short body laying length and shall be provided with two (2)

inch square wrench nut right angle operators. Valve shall have a stainless steel-through shaft and rubber seat.

d. Tapping Sleeves and Valves

Tapping sleeves shall be manufactured in accordance with the applicable sections of AWWA C111, C500, C509, and C600. Tapping valves shall comply with the specifications set forth under the section entitled Gate Valves.

Unless otherwise noted on the plans, all tapping sleeves and valves shall be placed in a gate well.

e. Air Release Valves

Air release valves shall be manufactured in accordance with AWWA C512.

7. FIRE HYDRANTS:

Fire hydrants shall be in accordance with the current edition of AWWA C502 and the OWNER's requirements. Drain holes in hydrants shall be plugged and watertight.

All hydrants shall be constructed with a companion gate valve in a three-piece, adjustable cast iron valve box.

Hydrants shall be set such that grade ring is 0.1-foot above finished grade at the hydrant base.

8. PIPE

a. Ductile Iron

Ductile iron pipe shall be manufactured in accordance with AWWA C151, latest revision. Minimum tensile strength shall be 60,000 psi, minimum yield strength 42,000 psi, and 10 percent minimum elongation. Pipe shall be designed for a minimum water working pressure of 350 psi, and a surge allowable of 100 psi.

Ductile iron pipe interior shall be standard cement double thickness lined and the pipe exterior shall be seal-coated with an approved bituminous seal coat. The cement lining shall be in accordance with AWWA C104 (ANSI Standard A21.4), latest revision.

Pipe wall thickness, subject to tolerance allowed in AWWA C151, shall be as shown in the OWNER's standards.

b. Polyvinyl Chloride

Polyvinyl Chloride (PVC) pipe shall meet the requirements of the ANSI/AWWA standard C909-98 (including any appendices) as amended for the pressure class of 200 psi (DR 14).

Tracing wire shall be provided per the OWNER's standards and details for all PVC water main. In addition, an approved continuous marking tape shall be provided and shall be placed 2 (two) feet below the finish grade. Wire shall be 12-gauge (woven) copper, insulated per the OWNER's requirements. Connection is required at all service leads, hydrants, and gate wells, with exposed wire above the ground surface. Conductivity shall be tested and approved by the OWNER prior to acceptance of the main. All splices in the wire shall be made with a gel-cap product such as 3M's "Direct Bury Splice Kit No. P054007/09964" that provides a waterproof seal.

9. FITTINGS

Fittings for ductile iron pipe and PVC pipe shall be of ductile iron and shall have a working pressure rating of three hundred fifty (350) pounds per square inch (psi) that meets the requirements of AWWA C110 (ANSI A21.10), or AWWA C153 (ANSI A21.53) for compact fittings with cement mortar lining. Cement mortar lining shall meet AWWA C104 (ANSI A21.4) specification for a double thickness lining

and the exterior shall be seal coated with an approved bituminous seal coat.

Where special adapters and fittings are necessary for occasional connections to existing water mains, shop drawings of such special adapters and fittings shall be submitted by the CONTRACTOR to ENGINEER for approval.

10. JOINTS

a. Ductile Iron

Joints for ductile iron pipe shall be push-on type conforming to AWWA-C111 (ANSI A21.11). Mechanical or flanged joints will be allowed for special applications subject to the approval of the ENGINEER. Restrained joints shall conform to the requirements of Section 19. Sealing gaskets, retainer glands and lubricants for joints shall meet the pipe manufacturer's specifications.

b. PVC

Joints for PVC water main pipe shall be push-on type conforming to AWWA C909.

11. VALVE BOXES

Valve boxes shall be as listed on the OWNER's utility standards summary.

12. GATE WELLS

Gate wells shall be constructed of reinforced concrete sections in accordance with details shown on the standard plans. Precast reinforced concrete gate well sections shall conform to ASTM C478. All tapping sleeves and valves are to be placed in a gate well unless otherwise shown or noted on the plans.

Gate well floors shall be of 3000 psi. reinforced concrete with at least 6 inches protruding from the periphery of the well wall. The minimum floor thickness shall be 6 inches.

Joints on precast reinforced concrete risers, cones, and base sections shall be as called for on the OWNER's standard details.

Manhole steps shall be reinforced polypropylene plastic No. PS2-PFS as manufactured by M.A. Industries, Inc., cast iron No. 8500 as manufactured by East Jordan Iron Works, approved equal, or as specified on the drawings.

Grade rings shall conform to ASTM C478 and shall have a minimum thickness of three (3) inches.

Mortar for use in water main structures shall conform to MDOT Specification 702, Type R-2.

Gate well covers and frames shall be as listed in the OWNER's utility standards summary.

Unless otherwise called for in the OWNER's standard details, valves in gate wells shall be at least six (6) inches above the floor of the gate well and supported with either brick or formed concrete.

13. THRUST BLOCKS

Thrust blocks shall be made of 3,000 psi concrete and shall be of adequate size and shape to resist the design working and surge pressures to which the main will be subjected. A designed restraint system shall be required on pipes larger than sixteen (16) inches in diameter.

14. POLYETHYLENE ENCASEMENT

Polyethylene encasement shall consist of tube or sheet material of minimum eight (8) mil thickness and shall meet all the requirements of AWWA Standard C105. Polyethylene film shall have a minimum tensile strength of 3,600 psi, a minimum elongation of 800 percent, and a minimum dielectric strength of 800 volts/mil of thickness.

Tube size or sheet width for each pipe diameter shall be as follows:

Nominal Pipe Diameter In.	Minimum Flat Tube (Inches)	Polyethylene Width in Sheet (Inches)
6	16	32
8	20	40
12	27	54
16	34	68
20	41	82
24	54	108
30	67	134
36	81	162

CONSTRUCTION

15. GENERAL

Excavation, bedding, and backfill for water main related structures shall be accomplished in accordance with requirements in the Earthwork Section.

Excavations shall be of sufficient width and depth to provide adequate room for the construction and installation of the work to the lines, grades, and dimensions as called for on the plans.

Install pipe, fittings and appurtenances in strict accordance with manufacturer's recommendations, AWWA C600, and these Specifications.

16. LAYING PIPE

a. Line and Grade

Pipe shall be carefully laid to line and grade and shall have bearing over its entire length except at joints where the joint hole shall be of such size as to give adequate room for working. Pipe shall be laid at the standard depth as shown on the standard details.

b. Preparation of Trench Bottom

Trench bottom preparation and backfilling shall be as follows: The trench width shall be a minimum of thirty (30) inches wide or as called for in the OWNER's standard details. Trench depths shall be as shown on the plans and generally shall provide not less than five and one half (5.5) feet of cover from top of water main to final surface grade above such mains. The bottom of trench in rock or cohesive soil shall be excavated neatly to the required grade. The trench bottom shall be filled with approved granular material for bedding in accordance with the standard details and shall be thoroughly compacted by tamping before the pipe is laid. The bedding shall be dug out at each bell end of the pipe to conform to the shape of the bell. Blocking under pipe is strictly prohibited.

c. Handling Pipe & Fittings

All pipes and castings shall be unloaded and distributed along the line of work in such manner and with such care as will effectually avoid damage to any pipe or fitting. Dropping pipe or fittings directly from the truck will not be permitted. Care must also be taken to prevent abrasion of the pipe coating. Wherever the coating may have been rubbed off, the part shall be recoated as may be required by the nature of the pipe coating.

d. Installation of Pipe

Installation of water main shall be made in in accordance with the published installation guide of the pipe manufacturer except as otherwise specified herein. Whenever instructions given by the manufacturer are at variance with the provisions specified herein, the laying standards provided herein shall govern.

Proper tools, including pipe pullers, special cutters, spacing yokes, machining tools, test caps, ring feeler gauges, etc. shall be

provided at the site of the work for installation of the pipe.

Immediately before laying each section of pipe or fitting, it shall be thoroughly cleaned of all debris; dirt or other accumulated foreign material. It shall be checked for damage to the coating or pipe material and repairs shall be made where required. If deemed irreparable by the ENGINEER, then it shall be removed from the job site. Care shall be taken to keep the interior of previously laid pipe clean and free from dirt and other foreign material. Bulkheads or other means shall be used at the open end of the previously laid pipe for this purpose.

After a length of pipe is placed in the trench, the spigot shall be centered in the bell of the adjacent pipe, the pipe shoved into proper position in the collar or bell and brought into true alignment. The pipe shall then be secured with earth that is carefully tamped under and on each side of the pipe.

Where a deflection must be made in the horizontal or vertical alignment that is equal to or greater than 11.25 degrees, then an appropriate bend section shall be used. If a minor alignment deflection is needed, then the deflection may be made at the joint as long as the deflection angle does not exceed the manufacturer's requirements or the owner's standards (generally not more than 4 degrees per joint).

e. Excavation to 18" Below Bottom of Pipe

As a result of the CONTRACTOR's construction procedure or where excavation has not uncovered a stable foundation subgrade at depth of six (6) inches below the bottom of pipe, the CONTRACTOR shall continue to excavate downward to a maximum distance of eighteen (18) inches below the bottom of pipe to reach stable foundation soil. The space resulting from such excavation and the pipe beddings shall be filled and constructed in the same manner and using the same materials specified

above. All costs for such construction shall be borne by the CONTRACTOR.

f. Excavation Below Limits Specified in Above Paragraph ("e")

Where excavation has not uncovered a stable, foundation subgrade at depths eighteen (18) inches below the bottom of pipe, then the CONTRACTOR shall stop further excavation and immediately notify the ENGINEER of the condition and of his intent to make a claim for additional cost. The ENGINEER shall investigate the soils conditions and may direct the CONTRACTOR to continue excavating if it appears that a stable subgrade can be obtained. In this case, the additional excavation beyond eighteen (18) inches below the bottom of pipe would be measured and paid for as trench undercut and refill. Material for refill of the undercut area shall be as described in the Earthwork Section. In the event that soil conditions are extremely severe, then the ENGINEER and soils consultant shall investigate the site conditions and shall prescribe the appropriate pipe support system to be used. Within ten (10) days after the ENGINEER determines the appropriate pipe support system to be used, the CONTRACTOR shall submit a detailed estimate for additional cost, excluding the costs to be borne by the CONTRACTOR in the above paragraph (e). The estimate shall include only those additional costs necessary to construct the pipe support system as directed by the ENGINEER. It shall not include construction costs prior to the stoppage of work. Upon acceptance of the CONTRACTOR's estimate, the ENGINEER shall issue a change order.

g. Backfill

Backfill shall be placed in accordance with the Earthwork specifications.

17. SPECIAL REQUIREMENTS FOR
PVC WATER MAIN

a. Pipe

Where the pipe must be cut, machine beveling shall be provided as specified by the manufacturer, unless the cut end will be butted against a fitting with an approved bolt-type joint.

All PVC pipe deflections shall be made using ductile iron fittings. PVC pipe shall not be placed or connected by “breaking” or “opening” joints. Physically bending the pipe is not allowed either. Each individual length of PVC pipe shall be placed in a straight line.

Where water main is to be placed on fill material, all fill material below the pipe must be compacted to ninety-five (95) percent maximum unit density.

PVC water main shall not be exposed to sunlight for more than one (1) week. The CONTRACTOR shall, at no additional cost, provide an opaque covering to shield all parts of the pipe. Such pipe that is not adequately protected will be rejected.

PVC water main shall not be installed when temperatures are below zero (0) degrees Fahrenheit.

Pipe shall be joined per the manufacturer’s recommendation. Push-on type joints shall not be installed past the “home” mark on the pipe, or otherwise disrupt the required elastomeric gasket.

PVC water main shall not be used in areas where any petroleum products are found or suspected to exist in the soils or surrounding area.

b. Fittings

Extreme care must be used when attaching fittings. Mechanical joints to PVC pipe must distribute the loading evenly to avoid damage, potential breaks, or weak points in the pipe.

c. Structures

Extreme care must be used when bringing PVC pipe into and out of structures. A uniform annular space must be created to eliminate any potential point loading on the pipe. Point loading and pipe movement at the structure joint can cause the pipe to split.

Rubber “boots” or “sleeves” are required for pipes entering structures (Press Wedge II, Res-Seal, Link-Seal, Kor-N-Seal, or approved equal).

The pipe manufacturer's tapping instructions must be followed when tapping PVC pipe.

d. Taps of PVC Water Main

Taps shall not be made on PVC water main that is bent, or otherwise in tension.

A saddle acceptable to the OWNER shall be provided for all taps to PVC water main.

All taps shall be made with a sharp bit and high-speed tap, as recommended by the manufacturer.

18. DEFECTIVE PIPE & FITTINGS

No pipe or fitting known to be defective shall be laid in the work. Any piece found to be defective after it has been laid shall be removed by the CONTRACTOR and replaced with a sound piece. If the major part of a defective pipe is sound, the good end may be cut off and used. Every such cut shall be square and ground smooth. Cut surfaces of ductile iron pipe shall be painted with two coats of approved asphaltum metal protective paint where required by the ENGINEER.

Damage to cement mortar linings in fittings and/or pipe shall be repaired in accordance with instructions in AWWA C104. Any plastic pipe with a scratch or gouge exceeding 10% of the wall thickness shall be rejected.

19. JOINT RESTRAINT

All pipe deflections greater than or equal to 11.25 degrees and all tees shall be restrained, tied or harnessed in a manner acceptable to the ENGINEER. The restraint shall be applied to joints each way from the deflection or tee an adequate distance to resist the axial thrust of the test pressure. Details of all proposed joint restraint, showing type and locations, shall be submitted by the CONTRACTOR to the ENGINEER for approval. Details of the proposed joint restraint design shall be prepared in accordance with the recommendations of the pipe manufacturer and guidelines published by the Ductile Iron Pipe Research Association (DIPRA). All joint restraint shall be considered incidental to water main construction unless listed separately on the Bid Form.

In conjunction with joint restraint, thrust blocks may be required at tees, bends, and ends as called for in the standard details. The CONTRACTOR must verify with the OWNER whether or not thrust blocks will be required.

Acceptable methods of joint restraint shall be as listed below unless otherwise specified on the construction plans. The OWNER may not accept all of the methods listed.

a. Ductile Iron Pipe

“Field-Lok” gasket by U S. Pipe through 24” diameter

“TR Flex” by U.S. Pipe 4” and larger diameter

“Usiflex” by U. S. Pipe (river crossing pipe)

“Snap-Lok” by Griffin Pipe Products 6” to 24” diameter

“Snap-Lok River Crossing Joint” by Griffin Pipe Products 6” to 24” diameter

“Mega Lug” joint restraint as manufactured by EBAA Iron Sales, Inc.

b. PVC Pipe

Ductile iron pipe shall be used in lieu of PVC pipe in areas where joint restraint is warranted.

20. SERVICE CONNECTIONS & TAPS

Water mains shall be tapped for corporation stops where shown on the plans or required for testing and sterilization of completed water mains. For ductile iron pipe, stops shall be threaded directly into the pipe.

21. CORPORATION STOP

Corporation stops shall be listed in the OWNER’s standards.

22. FITTINGS, VALVES, HYDRANTS & ADAPTERS

Valves, fittings and hydrants shall be installed using current standards for joints being used for this project. Wherever adapters are required to connect the proposed water main with an existing pipe of another material, the nominal I.D. of the adapter shall not be smaller in diameter than either of the adjacent pipes. Special machined faced parts shall be provided where required to connect to existing mains.

Air release valves shall be provided at high points in the water main line.

23. SETTING HYDRANTS

At points indicated on drawings, a hydrant assembly shall be installed consisting of a hydrant, six (6) inch gate valve, cast iron valve box, and all pipe necessary for a complete job. Valves shall be located three (3) feet from the hydrant or as shown on typical setting detail on the standard details.

If hydrants are furnished with drain outlets, the outlets shall be permanently capped or plugged.

Each hydrant shall be set truly plumb and held firmly braced in this position. Connection of the hydrant to the branch and the joint restraint shall be made according to the standard details.

Hydrants shall be factory painted with first quality metal protective paint. The color and paint type will be the OWNER's standard.

24. FINAL GRADE ADJUSTMENTS

a. Final Grade – Existing Structures

Adjustment of gate well structures shall apply to all final vertical changes made on existing structures where the elevation of the cover is not changed by more than six inches. Vertical changes in excess of six (6) inches will be treated as structure reconstruction.

b. Final Grade – New Structures

Final grade adjustment of new structures shall be considered as incidental to the structure construction.

Final grade adjustments may be made using either brick and mortar construction or precast concrete adjustment rings at the option of the CONTRACTOR.

The maximum allowable grade adjustment using grade rings shall be fifteen (15) inches. Final grade adjustment for manholes located in pavements and sidewalks shall be made with brick and mortar. A minimum of three (3) or maximum of six (6) courses of brick shall be placed on top of the precast cone section.

25. HYDRANT TESTING

Each hydrant assembly shall be tested by the CONTRACTOR. Test shall consist of flushing the hydrant for a minimum of ten

(10) minutes. During test period, the six (6) inch gate valve shall be closed and opened. The CONTRACTOR shall furnish necessary hoses for disposal of water. A testing schedule and method of disposing of flushing water shall be submitted to the ENGINEER for approval. The CONTRACTOR shall coordinate the testing schedule with the local fire department and the OWNER.

The CONTRACTOR shall provide all necessary equipment and labor for making the tests and cost of same shall be incidental to the unit price bid for hydrants.

26. CONNECTION TO EXISTING MAINS

Where shown on the plans, connection of existing mains to new mains will be done only after the new mains have been satisfactorily pressure-tested and are shown to be sterile by results of the bacteriological analysis.

27. FLUSHING OF WATER MAINS

Prior to disinfection and hydrostatic testing, newly constructed water mains less than twenty-four (24) inches in diameter shall be thoroughly flushed to remove all accumulated debris that may have entered the line during construction. Flushing shall include the use of a "polly pig" or approved equal equipment, to remove accumulated deposits. The frequency of running the "polly pig" through the water mains shall be determined by the debris discharging from the effluent. Several passes with the "polly pig" through the newly constructed system may be required before the main is acceptable. Procedures for use of the "polly pig", or approved equal equipment, shall be per the manufacturer's specifications. Mains twenty-four (24) inches in diameter and larger shall be manually cleaned and checked during installation.

28. STERILIZATION OF MAINS

After flushing, the water mains shall be chlorinated in accordance with AWWA C651 "Disinfecting Water Mains," (latest revision). Chlorination requirements apply for both ductile iron and PVC water mains.

The three methods for chlorination that are described in AWWA C651 are summarized as follows:

- | | | |
|----|-------------------------|--|
| a. | Tablet Method: | Requires an average chlorine dose of approximately 25 ppm over 24 hours. |
| b. | Continuous Feed Method: | Requires an initial concentration of 25 ppm and a residual of not less than 10 ppm after 24 hours. |
| c. | Slug Method: | Requires an initial concentration of 100 ppm for at least 3 hours. |

After the applicable retention period, heavily chlorinated water should not remain in prolonged contact with the pipe. In order to prevent damage to the pipe lining or corrosion damage to the pipe itself, the heavily chlorinated water shall be flushed from the main until chlorine measurements show that the concentration in the water leaving the main is no higher than that generally prevailing in the distribution system or is acceptable for domestic use.

The environment to which the chlorinated water is to be discharged shall be inspected. If there is any possibility that the chlorinated discharge will cause damage to the environment (in the opinion of the ENGINEER), a neutralizing chemical shall be applied to the water to be wasted to thoroughly neutralize the residual chlorine. Where necessary, federal, state or local regulatory agencies should be contacted to determine special provisions for the disposal of heavily chlorinated water.

After final flushing and before the new water main is connected to the distribution system, two consecutive sets of acceptable samples, taken at least twenty-four (24) hours apart shall be collected from the new main. At least one set of samples shall be collected from every 1,200 feet (366 meters) of the new water main, plus one set from the end of the line and at least one set from each branch. All samples shall be tested for bacteriological quality and shall show the absence of coliform organisms.

If this analysis shows the presence of harmful bacteria, the CONTRACTOR shall repeat the sterilization process until such time as the mains are shown to be sterile by the results of the bacteriological analysis.

The CONTRACTOR shall furnish chlorine and all necessary labor and equipment for its application. The costs associated with the sterilization and testing work shall be considered as incidental to the unit price bid for water main. The CONTRACTOR shall make suitable arrangements with the OWNER for bacteriological analysis. The CONTRACTOR shall dispose of high residual chlorine water by a method approved by the ENGINEER.

Mains twenty-four (24) inches in diameter and larger shall be chlorinated in sections between main line valves. Chlorine solution shall be renewed and transferred to the next adjacent section of pipe minimizing the volume of water needed to sterilize the main.

29. HYDROSTATIC TESTING OF WATER MAINS

Within a reasonable length of time following pipe-laying and backfilling, the CONTRACTOR shall complete all work necessary to perform hydrostatic testing.

The hydrostatic testing shall be conducted in accordance with AWWA C600 "Installation of Ductile Iron Water Mains and Their Appurtenances" (latest revision) for ductile

iron main and AWWA C605 "Installation of PVC Water Main" for PVC water main.

The CONTRACTOR shall perform all necessary preliminary hydrostatic tests and shall make all necessary repairs, including the repair of all visible leaks and cracks, and retests with his own forces to ready the water mains for final hydrostatic testing by the OWNER. Immediately after the water mains have passed such preliminary tests, the CONTRACTOR shall submit a written request to the OWNER for final hydrostatic testing.

The hydrostatic test shall be conducted before the new water main is connected to the existing water system, except as specified below. The CONTRACTOR shall furnish all necessary personnel, temporary blow-offs, plugs, bracing, test pumps and all other necessary apparatus for conducting the test and cost of same shall be incidental to the unit price bid for water main. Testing shall be conducted under the supervision of the ENGINEER.

At the option of the ENGINEER, the CONTRACTOR may test against closed valves providing that the new main to be tested and the testing apparatus shall have first been flushed and chlorinated in accordance with accepted procedure. After chlorination and subsequent flushing, a sample of water must show safe bacteriological results through a test by a recognized laboratory. In the event of an unsatisfactory hydrostatic test the CONTRACTOR will cut the new main, install caps or plugs, pressure test and re-chlorinate without additional cost or charge.

Before applying test pressure, all air shall be expelled from the pipe. If necessary to accomplish this, taps shall be made at points of highest elevation in the pipe and such openings subsequently closed, prior to test, with tight threaded brass plugs.

Testing allowance is defined as the quantity of water to be supplied in the newly laid

pipe or any valved section under test, which is necessary to maintain pressure within 5 psi of the specified test pressure after the pipe has been filled with water and the air expelled.

For ductile iron and PVC water main, test pressure shall be maintained at 150 psi at the point of highest elevation in the test section by pumping potable water into the pipe for a period of at least two (2) hours and in all cases long enough to permit assurance of a satisfactory test. Leakage is measured by the quantity of water pumped into the pipe to maintain 150 psi.

According to AWWA C600, for ductile iron water main, the leakage during the test shall not exceed a rate of:

$$L = \frac{SD\sqrt{P}}{133,200}$$

Where:

L = allowable leakage (gallons per hour)

S = length of pipe tested (feet)

D = nominal pipe diameter (inches)

P = average test pressure (psi)

According to AWWA C605, for PVC water main, the leakage during the test shall not exceed a rate of:

$$L = \frac{ND\sqrt{P}}{7,400}$$

Where:

L = allowable leakage (gallons per hour)

N = number of joints in the length of pipeline tested

D = nominal pipe diameter (inches)

P = average test pressure during the leakage test, in pounds per square inch (gauge)

Minimum size pressure gauge is to be three and one-half (3-1/2) inch in one (1) pound increments. Any faulty pipe, fittings, gate valves or other accessories disclosed by testing shall be replaced with sound materials and the test shall be repeated as often as necessary until the specified requirements have been met.

30. WATER USAGE

Unless otherwise allowed by the OWNER, the CONTRACTOR shall furnish all water used on this project including water used for hydrostatic testing, chlorination and flushing. If he elects to purchase water from the OWNER he shall pay for the full-metered amount at the current water rate for the system used.

If a meter is not available to measure the volume of water, the CONTRACTOR shall pay for a minimum of five times the volume of the pipe installed or as otherwise determined by the ENGINEER.

If more than one CONTRACTOR is involved in the installation of the water system, the ENGINEER shall prorate the amount of water used between the various CONTRACTORS based upon the volume of the pipe in each section.

31. RIVER CROSSINGS

River crossing shall be made with a freely deflecting locked joint pipe. Pipe shall be ductile iron with bell ball type joint. Pipe shall be the same class and grade as called for on the plans and in the laying schedule. Ball joint river crossing pipe may be installed by pulling or floating across the river.

Trench shall be backfilled with clean washed stone.

32. POLYETHYLENE ENCASEMENT

a. General

The polyethylene encasement shall prevent contact between the pipe and the surrounding backfill and bedding material but is not intended to be a completely airtight and water tight enclosure. Overlaps shall be secured by the use of adhesive tape, plastic string, or any material capable of holding the polyethylene encasement in place until backfilling operations are completed.

This standard includes three different methods for the installation of polyethylene encasement on pipe. Methods A and B are for use with polyethylene tubes, and method C is for use on polyethylene sheets.

b. Installation Methods

Method A

Cut polyethylene tube to a length approximately two (2) feet longer than that of the pipe section. Slip the tube around the pipe, centering it to provide a one (1) foot overlap on each adjacent pipe section, and bunching it accordion-fashion lengthwise until it clears the pipe ends.

Lower pipe into trench and make up the pipe joint with the preceding section of pipe. A shallow bell hole must be made at joints to facilitate installation of the polyethylene tube.

After assembling the pipe joint, make the overlap of the polyethylene tube. Pull the bunched polyethylene from the preceding length of pipe, slip it over the end of the new length of pipe, and secure in place. Then slip the end of the polyethylene from the new pipe section over the end of the first wrap until it overlaps the joint at the end of the preceding length of pipe. Secure the overlap in place. Take up the slack width to make a snug, but not tight, fit along the barrel of the pipe, securing the fold at quarter points.

Repair any rips, punctures or other damage to the polyethylene with adhesive tape or with a short length of polyethylene tube cut open, wrapped around the pipe, and secure in place. Proceed with installation of the next section of pipe in the same manner.

Method B

Cut polyethylene tube to a length approximately one (1) foot shorter than that of the pipe section. Slip the tube around the pipe, centering it to provide 6 inches of bare pipe at each end. Make polyethylene snug, but not tight, secure ends as described previously.

Before making up a joint, slip a three (3)-foot length of polyethylene tube over the end of the preceding pipe section, bunching it accordion-fashion lengthwise. After completing the joint, pull the 3-foot length of polyethylene over the joint, overlapping the polyethylene previously installed on each adjacent section of pipe by at least one (1) foot, make snug and secure each end.

Repair any rips, puncture, or other damage to the polyethylene. Proceed with installation of the next section of pipe in the same manner.

Method C

Cut polyethylene sheet to a length approximately two (2) feet longer than that of the pipe section. Center the cut length to provide a one (1) foot overlap on each adjacent pipe section, bunching it until it clears the pipe ends. Wrap the polyethylene around the pipe so that it circumferentially overlaps the top quadrant of the pipe. Secure the cut edge of polyethylene sheet at intervals of approximately three (3) feet.

Lower wrapped pipe into the trench and make up the pipe joint with the preceding section of pipe. A shallow bell hole must be made at joints to facilitate installation of the polyethylene. After completing the joint, make the overlap as described previously.

Repair any rips, punctures or other damage to the polyethylene. Proceed with installation of the next section of pipe in the same manner.

c. Appurtenances

Pipe-shaped appurtenances: Cover bends, reducers, offsets and other pipe-shaped appurtenances with polyethylene in the same manner as the pipe.

Odd-shaped appurtenances: When valves, tees, crosses and other odd-shaped pieces cannot be wrapped practically in a tube, wrap with a flat sheet or split length of polyethylene tube by passing the sheet under appurtenance and bringing it up around the body. Make seams by bringing edges together, folding over twice, and taping down. Handle width and overlaps at joints as described above. Tape polyethylene securely in place at valve stem and other penetrations.

d. Openings

Openings in encasement: Provide openings for branches, service taps, blow-offs, air valves, and similar appurtenances by making an X-shaped cut in the polyethylene and temporarily folding back the film. After the appurtenance is installed, tape the slack securely to the appurtenance and repair the cut, as well as any other damaged areas in the polyethylene, with tape.

e. Junctions

Junctions between wrapped and unwrapped pipe: Where polyethylene wrapped pipe joins an adjacent pipe that is not wrapped, extend the polyethylene wrap to cover the adjacent pipe for a distance of at least two (2) feet. Secure the end with circumferential turns of tape.

f. Backfill

Backfill for polyethylene-wrapped pipe: Use the same backfill material as that specified

for pipe without polyethylene wrapping, exercising care to prevent damage to the polyethylene wrapping when placing backfill. Backfill material shall be free from cinders, refuse, boulders, rocks, stones or other material that could damage polyethylene.

End of Section

RESTORATION

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GENERAL

1. SCOPE OF WORK

This work shall be subject to conditions of the General Conditions, General Specifications and include the furnishing of labor, materials, tools, accessories, equipment and services necessary for restoration of the surfaces shown on the Contract drawings and/or as herein required.

This work shall include replacement of all permanent type roadway surfaces, concrete sidewalks, curb and gutters, driveways, trees, culverts, fences, ditches, and miscellaneous items damaged or removed due to construction. Disposal of excess or unsuitable materials shall be considered as part of the restoration work. All such work shall be in accordance with the best modern practice, the OWNER's standards, and as specified herein.

Prior to performing work under this section, the CONTRACTOR shall submit to the ENGINEER for approval his construction methods and design mixes, sieve analysis and/or certification of compliance with the 2012 Michigan Department of Transportation (MDOT) Standard Specifications for Construction except where otherwise noted. No permanent surface restoration shall be performed until all underground work has been approved.

In the event that these specifications conflict with those of the OWNER or the controlling agency, the more stringent requirements shall govern.

2. SHOP DRAWINGS

When required by the ENGINEER, shop drawings shall be furnished as prescribed under the General Conditions.

Before the CONTRACTOR orders any restoration materials that he is proposing to use as substitutes for specified items, he shall submit details of the substitutes to the ENGINEER for consideration and approval.

3. MDOT STANDARDS

References to the Michigan Department of Transportation (MDOT) Specifications shall pertain to the 2012 Standard Specifications for Construction.

MATERIALS

4. AGGREGATE

a. Gravel Approaches and Roads

Natural aggregate shall be used for gravel approach (driveways) and road restoration and shall meet the requirements of MDOT 21AA or 22A as shown in Table 902-1 of the MDOT Standard Specifications for Construction.

b. Shoulders

Natural aggregate shall be used for shoulders and shall meet the requirements of MDOT 21AA, 22A, or 23A as shown in Table 902-1 of the MDOT Standard Specifications for Construction.

c. Base Course

Natural aggregate shall be used for base course construction and shall meet the requirements of MDOT 21A, 21AA, or 22A as shown in Tables 902-1 and 902-2 of the MDOT Standard Specifications for Construction.

5. HOT MIX ASPHALT SURFACE, LEVELING, & BASE COURSES

Hot mix asphalt materials used for pavement construction shall meet the requirements of section 501.02 of the MDOT Standard Specifications for Construction or the requirements of the controlling agency as called for on the construction plans.

6. CONCRETE PAVEMENT, SIDEWALKS, CURB & GUTTER

Concrete used for pavement, sidewalk, and curb and gutter construction shall meet the requirements of MDOT grade P1 concrete or the requirements of the controlling agency as called for on the construction plans. MDOT grade P-NC may also be used where circumstances require the use of a

high-early strength concrete. Refer to Table 601-2 of the MDOT Standard Specifications for Construction.

7. TOPSOIL

Topsoil shall be screened and shall consist of loose black-colored soil that is suitable for the growth of grass seed or sod. The topsoil shall be obtained from the upper layer of an existing fertile soil and be free of limbs, twigs, rocks, stones, muck, roots and debris, etc. and containing organic matter rich in nutrients with negligible clay content.

Topsoil shall meet the following requirements:

- a. The pH range shall be from 6.0 to 7.5. Topsoil outside of this range shall be amended by the addition of pH adjusters as approved by the Engineer.
- b. The organic matter content shall range between 2% and 6% (by dry sample weight).
- c. The soil texture shall be a sandy loam, silt loam, or loam where the sand, silt, and clay contents (by dry sample weight) fall within the following ranges:

Sand.....	40% to 65%
Silt	25% to 60%
Clay	5% to 15%

- d. The gradation shall be as follows:

Sieve Designation	% Passing
1 inch screen	100
0.25 inch screen	97 - 100
No. 10 U.S.S. mesh sieve	95 - 100
No. 140 U.S.S. mesh sieve	15 - 35

- e. The soil salinity as measured by the electrical conductivity of a saturated soil

sample shall not exceed 2dS/m (decisiemens/meter).

- f. Topsoil samples may be taken from stockpiles by the ENGINEER for submission to a testing laboratory. Topsoil that does not meet the required specifications shall be removed from the project site by the CONTRACTOR and shall be replaced with suitable topsoil that meets the testing requirements.

8. SEED & FERTILIZER

Seed and fertilizer shall meet the following requirements:

Table R-1

Location	Seeding* Requirement	Fertilizer Requirement
Maintained Lawn Areas	MDOT Type THM Mix (20% Perennial Rye, 30% Kentucky Blue, 50% Red Fescue) applied at 220 lbs./acre	MDOT Class A, 228 lbs./acre
Fields, Slopes & Ditch Banks, Etc.	MDOT Type THV Mix (30% Perennial Rye, 15% Kentucky Blue, 45% Red Fescue, 10% Fults Salt) applied at 220 lbs./acre	MDOT Class B, 120 lbs./acre

* percent mixture proportions by weight

All grass seeding shall meet the requirements for purity and germination as called for in the MDOT Standard Specifications for Construction Table 917-1 for Seed Mixtures. Seed shall be delivered in durable containers which show the

manufacturer's name, lot number, weight, contents, purity, and germination. Although Table R-1 lists only two typical seeding mixtures, other seeding mixtures shown in MDOT Tables 816-1 and 917-1 may be used where approved by the Engineer.

9. MULCH & MULCH BLANKETS

Mulch and mulch blankets shall meet the following requirements:

- a. Loose Mulch. Mulching material shall consist of any straw or marsh hay in an air-dry condition. Hay in an air-dried condition will be permitted only when straw mulch or marsh hay is unavailable. Mulch materials shall be undamaged, rot free, clean, substantially free of weed seed and other objectionable foreign matter.

- b. Mulch Blankets (for moderate runoff condition). Mulch Blankets shall be one of the following or an approved equal:

S1 Erosion Control Blanket –
BonTerra America

Contech ERO-MAT -
Contech Construction Products

Erosion Control Blanket DS-75 –
North American Green

- c. High Velocity Mulch Blankets (for medium to heavy runoff condition). High velocity mulch blankets shall be one of the following or an approved equal:

S2 Erosion Control Blanket –
BonTerra America

Contech High Velocity ERO-MAT –
Contech Construction Products

ECS High Impact Excelsior Blanket –
Erosion Control Systems, Inc.

ECS High Velocity Straw Mat –
Erosion Control Systems, Inc.

Erosion Control Blanket DS-150 –
North American Green

10. SOD

Sod shall meet the requirements of Section 917.13 of MDOT Standard Specifications for Construction. The Contractor shall keep the sod watered until a vigorous growth is established.

Sod must be an upland mineral soil sod. Sod must be grown on loam soils. Sod grown on peat is not acceptable for use.

11. FENCING

Chain link and woven wire fence materials shall meet the requirements of Section 907 of MDOT Standard Specifications for Construction. Chain link fabric shall be as called for on the construction drawings (aluminum-coated, zinc-coated, or vinyl-coated). Fences made of other materials (wood board, split rail, iron, etc.) shall be replaced in kind or as called for on the construction drawings. In this case, fence materials and construction methods shall meet the applicable standards of ASTM.

12. TREES & SHRUBS

Trees and shrubs shall be quality, nursery-grown stock with adequate root growth (balled and burlapped). Nursery stock shall meet the standards of the current edition of the American Standard for Nursery Stock as published by the American Association of Nurserymen, as well as the standards of Section 917 of the MDOT Standard Specifications for Construction.

13. TIMBER POSTS

Timber used for fence, guide, guard and mailbox posts shall meet the requirements of Section 912.08 of the MDOT Standard Specifications for Construction.

14. TRAFFIC SIGNS & POSTS

Traffic and street signs that are removed or damaged shall be replaced in kind. The materials used for such sign and post replacements shall meet the applicable standards of Section 919 of the MDOT Standard Specifications for Construction.

15. PAVEMENT STRIPING

Pavement striping materials shall meet the requirements shown in Section 920 of the MDOT Standard Specifications for Construction.

CONSTRUCTION

16. PAVEMENT RESTORATION

The aggregate and pavement thicknesses shown in the following sections are intended to be a guideline for minimum thicknesses. Thicker sections may be required depending upon the requirements of the OWNER or the controlling agency. All pavements shall be restored to the elevation and section that existed prior to construction.

a. Gravel Shoulders and Approaches

Gravel shoulders and approaches shall be constructed as described in Section 307.03 of the MDOT Standard Specifications for Construction.

Gravel shoulder restoration shall consist of placement and compaction of MDOT 21AA limestone or MDOT 22A gravel on a suitable subgrade to form a minimum six (6) inch thick section. The 21AA limestone or 22A gravel shall be compacted to a minimum density of ninety-eight (98) percent of the maximum unit weight. The restored shoulder width shall match the existing width.

Restoration of gravel approaches shall consist of placement and compaction of MDOT 21AA limestone or MDOT 22A gravel on a suitable subgrade as called for

on the plans to form a minimum six (6) inch thick section. The 21AA limestone or 22A gravel shall be compacted to a minimum density of ninety-eight (98) percent unit of the maximum unit weight. The restored approach width shall match the existing width.

b. Gravel Roads

Restoration of gravel roads shall consist of placement and compaction of MDOT 21AA limestone, MDOT 22A gravel, or MDOT 23A gravel as called for in the plan details to form a minimum eight (8) inch thick section. The restored road width shall match the existing road width. Gravel roads shall be constructed as described in Section 306.03 of the MDOT Standard Specifications for Construction.

c. Aggregate Base Courses

Aggregate base courses shall be placed and compacted to the thickness and width as called for on the plan details and as described in Section 302.03 of the MDOT Standard Specifications for Construction. Unless otherwise indicated in the Supplemental Specifications, aggregate base courses shall be compacted to a minimum density of ninety-eight (98) percent of the maximum unit weight.

d. Sawcutting

All pavement, curb and gutter, and sidewalk removals shall be accomplished by sawcutting with a power-driven concrete saw. Sawcutting shall be full depth for all pavements (concrete, bituminous, concrete with bituminous overlay).

In bituminous pavement, sawcut lines shall be parallel with or perpendicular to the direction of vehicle travel.

In concrete pavement, sawcut lines shall be cut parallel with pavement joints. Sawcuts shall not be nearer than five (5) feet to a transverse joint, to the center of pavement,

or to the edge of pavement such that no existing or replacement pavement section shall be less than five (5) feet in width. If the proposed sawcut is nearer than five (5) feet to a joint or centerline of a pavement, then removal and replacement shall be extended to said joint or centerline.

If an integral concrete curb is to be removed, then the minimum removal width shall be eighteen (18) inches.

e. Hot Mix Asphalt (HMA) Pavement

Hot mix asphalt pavements shall be constructed in accordance with the plan details and Section 501 of the MDOT Standard Specifications for Construction. Where new asphalt pavement is to adjoin existing asphalt pavement, a two (2) foot wide butt joint shall be constructed. A bond coat shall be applied to the existing pavement surface. Unless otherwise called for in the plan details, the following sections shall apply as a minimum:

Bike paths:	3" HMA over 4" 21AA aggregate base (with soil sterilant application)
Residential driveways:	3" HMA over 6" 21AA aggregate base
Commercial driveways:	4" HMA over 8" 21AA aggregate base; or 8" asphalt
Residential streets:	4" HMA over 8" 21AA aggregate base; or 8" asphalt
Collector road:	9" HMA over 6" 21AA aggregate base

The laboratory density of HMA pavement shall be determined by the Marshall Procedure ASTM D-1559 using 50 blows on each of the specimens as the compactive effort. One set of three (3) specimens shall be made on the first day of placement and on subsequent days as determined by the Engineer.

The measurement of field-compacted density shall be done with a nuclear gage. The percent of compaction obtained shall be determined by dividing the field-compacted density by the laboratory density and multiplying the result by 100. Unless otherwise indicated in the plan details or Supplemental Specifications, all HMA pavements shall be compacted to a minimum calculated density of 97%.

Density tests shall be taken on the completed pavement at a frequency of one test every 500 linear feet of paving lane, except for the last unit which will be 500 linear feet, plus any fractional unit less than 250 feet in length, or will be a fractional unit of 250 feet or more in length. Miscellaneous areas such as intersections, crossovers and widening lanes less than 250 feet long will be tested as directed by the Engineer.

f. Concrete Pavement

Concrete pavements shall be constructed in accordance with the plan details as well as Sections 602 and 801 of the MDOT Standard Specifications for Construction. Where new concrete pavement is to be anchored to old pavement, dowel bars and lane ties shall be installed in accordance with MDOT Standard Plans. Joints shall be installed in the new concrete pavement to match existing joint types and locations. Reinforcing steel shall be similar to that in the existing pavement and shall provide the same cross sectional area of reinforcement per foot as the existing pavement. Unless otherwise called for in the plan details, the following sections shall apply as a minimum:

Residential driveways:	6" non-reinforced concrete over 4" sand base
Commercial driveways:	8" non-reinforced concrete over 4" sand base
Residential	8" non-reinforced concrete

streets: over 6" sand base

Collector road: 9" non-reinforced concrete over 6" sand base

g. Concrete Sidewalk and Ramps

Concrete sidewalks and ramps shall be constructed in accordance with the plan details and Section 803 of the MDOT Standard Specifications for Construction. Unless otherwise called for in the plan details, the following sections shall apply as a minimum:

Sidewalks: 4" concrete over 4" sand base

Sidewalks (at residential drive crossing): 6" concrete over 4" sand base

Sidewalks (at commercial drive crossing): 8" concrete over 4" sand base

Sidewalk ramps: 4" concrete over 4" sand base

h. Concrete Curb and Gutter

Concrete curb and gutter shall be constructed in accordance with plan details and Section 802 of the MDOT Standard Specifications for Construction.

17. TURF ESTABLISHMENT

The CONTRACTOR shall furnish and place topsoil, seed, or sod, and fertilizer for all areas that were disturbed during construction. Seed and sod shall be installed in accordance with the seasonal limitations that are described in section 816.03 of the MDOT Standard Specifications for Construction unless directed otherwise by the Engineer.

a. Topsoil

Unless otherwise called for on the plans, a minimum of three (3) inches of topsoil shall be placed for areas that are to be restored with seeding or sodding. Topsoil shall be placed on a prepared earth bed in accordance with Section 816.03A of the MDOT Standard Specifications for Construction.

The existing earth bed shall be graded such that the placement of topsoil and sod will meet the final plan grades.

b. Seed

Seeding shall be sown in accordance with Section 816.03C of the MDOT Standard Specifications for Construction. The application rate for the seeding shall be as shown in the table in part 8 of the Materials Section.

c. Mulch and Mulch Blankets

Mulch and mulch blankets shall be placed over seeded areas as called for in Section 816.03E through H of the MDOT Standard Specifications for Construction. If mulch blankets must be secured to a slope, then biodegradable netting and biodegradable earth staples shall be used.

Mulch anchoring shall be considered as incidental to mulch placement unless a pay item for mulch anchoring has been included in the Bid Form.

d. Sod

Sod shall be placed in accordance with Section 816.03D of the MDOT Standard Specifications for Construction.

A sod cutter shall be used to establish a smooth vertical edge when new sod is to abut existing sod.

e. Fertilizer

Fertilizer shall be placed in accordance with Section 816.03B of the MDOT Standard Specifications for Construction. The

application rate for the fertilizer shall be as shown in table in Part 8 of the Materials Section.

f. Watering and Maintenance

It is the responsibility of the CONTRACTOR to regularly water new seed and sod in order to establish a dense lawn of permanent grasses that is free from mounds and depressions. Any portion of a sodded area that "browns-out" or does not firmly knit to the soil base, or any portion of a seeded area that fails to show a uniform germination, shall be resodded or reseeded. Such resodding or reseeding shall be at the CONTRACTOR's expense and shall continue until a dense lawn is established.

Watering seed and sod shall be considered as incidental to the turf establishment work unless a pay item for water has been included in the Bid Form.

18. FENCING

Prior to the start of any fence restoration work, the CONTRACTOR shall verify that the line and grade are correct.

a. Removing and Replacing Existing Fences

Fences shall be removed and replaced or shall be removed as indicated on the Plans or as directed by the ENGINEER. If any of the existing material is damaged or destroyed, the CONTRACTOR shall replace the material at his expense. Replacement fence material shall be of a condition comparable to that which existed prior to construction.

After the fence removal or relocation operations are complete, all surplus material shall be removed and disposed of by the CONTRACTOR at his expense unless otherwise called for on the Contract Documents.

Any holes or voids resulting from the fence post removal operation shall be backfilled

with a suitable material, as approved by the ENGINEER.

b. Placing New Fence

Woven wire and chain link fencing shall be installed in accordance with Sections 808.03A and D of the MDOT Standard Specifications for Construction. If called for on the plans, a top rail shall be used in place of tension wire for the chain link fence construction. Other fence types (timber, boulders, decorative rock, etc.) shall be constructed in accordance with plan details.

19. GUARDRAIL

Guardrail shall be placed in accordance with Section 807 of the MDOT Standard Specifications for Construction. Guardrail design shall be approved by the ENGINEER and shall conform to the current applicable standards of the agency that has jurisdiction of the right-of-way.

Any holes or voids resulting from the guardrail post removal operation shall be backfilled with a suitable material, approved by the ENGINEER.

20. TREE & SHRUB PLANTING

Trees and shrubs shall be planted in accordance with Section 815 of the MDOT Standard Specifications for Construction. Nursery stock shall conform to the standards shown in the American Standard for Nursery Stock (ANSI Z60.1-1996).

Watering and cultivating trees and shrubs during the establishment period shall be considered as incidental to the tree and shrub planting work unless a pay item for watering and cultivating has been included in the Bid Form.

21. MAILBOXES

Where mailbox post replacement is called for on the plans, new mailbox posts shall be

furnished and installed in accordance with Section 807 of the MDOT Standard Specifications for Construction and the plan details.

22. TRAFFIC SIGNS & POSTS

Placement of traffic signs and posts shall be done in accordance with the applicable Sections in 810 of the MDOT Standard Specification for Construction, the current edition of the Michigan Manual of Uniform Traffic Control Devices, and the plan details.

23. PERMANENT PAVEMENT STRIPING

Permanent pavement striping shall be placed in accordance with the plan details and Section 811 of the MDOT Standard Specifications for Construction.

24. DRAINAGE STRUCTURES,
CULVERTS, & DITCHES

As part of restoration, the CONTRACTOR shall be responsible for cleaning out all drainage structures, culverts, and ditches that are located within the area of construction. All ditches shall be restored such that drainage will flow freely. The cost of this work shall be considered as incidental to the project.

25. PROGRESS OF FINAL
RESTORATION

If in the judgement of the OWNER, adequate site restoration efforts are not being expended, including but not limited to, roadway, driveway and drainage maintenance, removal of surplus materials, restoration of all signs, mail boxes and like items, then the OWNER will take the necessary steps to perform such restoration and shall charge the CONTRACTOR for all of the costs until proper order is restored.

End of Section

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GENERAL

A. PRICES AND MEASUREMENT:

Payment for work under this contract will be based on a unit price or lump sum for work actually completed. Final measurements of the work will be taken by the Engineer to determine the amount of work done and thereby determine the total cost. The method of applying the unit prices to measured quantities will be as herein specified. Payment will include the cost of all labor, tools, materials, and equipment necessary to do the work.

Several items may have been included in the bid form but may not be called for on the plans. These items have been included in order to establish a unit price in the event that the item of work is necessary. The Contractor should be aware that these items may increase, decrease, or be zero based on field conditions, or Owner direction.

B. INCIDENTAL ITEMS:

Any items of work indicated as incidental or included shall be considered as part of the project work and shall be completed at no additional expense to the Owner. Incidental or included items shall include labor, materials, and equipment that may not be specifically listed in the Bid Form or in the drawings or specifications, but which are necessary to complete the work.

C. PERMITS:

A number of permits have been applied for by the Owner of this project. The permits must be acquired from the appropriate agency by the Contractor when they are approved. Any permit fees, bonds, and/or permit agency inspection costs will be the responsibility of the Contractor and shall not result in additional cost to the Owner. A list of permits required for this project is shown in the Supplemental Instructions to Bidders section.

MOBILIZATION

(Bid Item)

The completed work as measured for MOBILIZATION will be paid for at the contract unit price for the following contract item (pay item):

<u>Pay Item</u>	<u>Pay Unit</u>
Mobilization, Max 5%	lump sum

The lump sum price shall be payment in full for all preparatory work and operations which may include, but is not limited to, the following items:

1. The movement of personnel, equipment, supplies, and incidentals to the project site.
2. The establishment of the Contractor's offices, buildings, and other facilities to work on the project.
3. Other work and operations that must be performed.
4. Expenses incurred, prior to beginning work on the various contract items on the project site.
5. Pre-construction costs, exclusive of bidding costs, which are necessary direct costs to the project rather than directly attributable to other pay items under the contract.
6. Permits, bonds, etc.

The pay item will state the maximum amount that can be bid. When the percentage of the original contract amount earned is less than 5 percent, the costs of project specific bonding, insurances, and permits will be reimbursed when a paid invoice is received by the Engineer. The costs of these will then be made in accordance with the Partial Payment Schedule shown below. The original contract amount is the total value of all contract items including the mobilization item. The percentage earned is exclusive of the mobilization item. The total sum of all payments for this item shall not exceed the original contract amount bid for mobilization, regardless of the fact that the Contractor may have, for any reason, shut down his work on the project, moved equipment away from the project and then back again, or for additional quantities or items of work added to the contract.

Partial Payment Schedule

Percentage of Original Contract Amount Earned	Percentage of Bid Price for Mobilization Allowed
5	50
10	75
25	100

When a pay item for mobilization is not included in the proposal, payment for any such work is considered to have been included in payments made for other items of work.

AUDIO VIDEO ROUTE SURVEY

(Bid Item)

The completed work as measured for AUDIO VIDEO ROUTE SURVEY will be paid for at the contract lump sum price for the following contract item (pay item):

<u>Pay Item</u>	<u>Pay Unit</u>
Audio Video Route Survey	lump sum

The lump sum price shall be payment in full for all labor, materials, and equipment necessary to prepare the audio video route survey in accordance with the specifications. Video recording limits are discussed in the Supplemental Specifications section.

Payment shall include provision of 2 sets of DVDs and a flash drive containing the complete recordings to the Engineer.

TRAFFIC MAINTENANCE AND CONTROL

(Bid Item)

The completed work as measured for TRAFFIC CONTROL will be paid for at the contract unit price for the following contract item (pay item):

<u>Pay Item</u>	<u>Pay Unit</u>
Traffic Control	lump sum

The contract lump sum price shall be payment in full for all labor, materials, and equipment necessary to furnish, install, and maintain all signs, cones, barricades, flagging, temporary striping etc. as required by the Michigan Manual of Uniform Traffic Control Devices and the Supplemental Specifications. Removal of any temporary signs or other traffic control equipment upon completion of the project shall be considered as incidental to the traffic maintenance and control work.

The Contractor shall submit a traffic control plan and/or meet with the Construction Observer and City Police Department prior to setting up any temporary traffic control devices. Traffic maintenance items shall be setup and maintained as directed by the Construction Observer and Police Department. Any adjustments to the traffic control necessary during the project, as determined by the Construction Observer or Police Department shall be included in the lump sum payment for traffic control and maintenance.

Up to 50% of the contract lump sum price will be paid upon satisfactory installation of the traffic maintenance and control measures. The remaining 50% will be paid upon final acceptance of the project.

SOIL EROSION CONTROL

(Bid Item)

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

<u>Pay Item</u>	<u>Pay Unit</u>
Erosion Control	lump sum

The contract lump sum price shall be payment in full for all labor, materials, and equipment necessary to furnish, install, and maintain soil erosion control measures in compliance with applicable laws and permit requirements. Maintenance work will include removal and replacement of soil erosion control items as directed by the Engineer. Removal of erosion control measures, accumulated sediment, and debris upon completion of the project shall be considered as included as part of the work. Up to 50% of the contract

unit price will be paid upon satisfactory installation of the soil erosion control measures. The remaining 50% will be paid upon final acceptance of the project. Restoration of disrupted areas shall be paid for separately under the appropriate surface restoration pay items. Filters shall be placed in all storm structures within the project areas, and silt fence installed as needed or as shown on the plans.

REMOVE TREE

(Bid Item)

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

<u>Pay Item</u>	<u>Pay Unit</u>
Tree, Rem, 6 inch to 18 inch	each
Tree, Rem, 19 inch to 36 inch	each

The size of trees will be determined by the average diameter of the tree trunk, measured to the nearest full inch, at a point 4 ½ feet above the base of the tree at the ground line. Trees having major limbs lower than 4 ½ feet from the ground shall be measured at the smallest diameter below such limbs.

The contract unit price shall be payment in full for all labor, material and equipment necessary to completely remove the tree, including all foliage and root systems, backfill the remaining hole, and to properly dispose of the materials off site. When tree removal is called for, the payment shall include removal of the stump. Separate payments for tree and stump removal shall not be made for the same tree. Removal of trees under 6" in diameter as well as logs, debris, brush, shrubs, topsoil, and other vegetation will be considered as Station Grading.

REMOVE CONCRETE CURB AND GUTTER

(Bid Item)

The completed work as measured for REMOVE CONCRETE CURB AND GUTTER will be paid for at the contract unit price for the following contract item (pay item):

<u>Pay Item</u>	<u>Pay Unit</u>
Curb and Gutter, Rem	feet

Concrete curb and gutter removal shall be measured along the gutter line in linear feet.

The contract unit price shall be payment in full for all labor, materials and equipment required to sawcut, remove, and properly dispose of the concrete curb and gutter offsite.

Integral curb and gutter in driveways shall be paid separately.

REMOVE PAVEMENT

(Bid Item)

The completed work as measured for REMOVE PAVEMENT will be paid for at the contract unit price for the following contract item (pay item):

<u>Pay Item</u>	<u>Pay Unit</u>
Pavt, Rem	square yard

Pavement removal shall be measured in place by area in square yards. The removal area shall be based upon the average length and width measurements as determined in the field by the Engineer.

The contract unit price shall be payment in full for all labor, material and equipment required to sawcut, remove, and properly dispose of the pavement off site. The contract unit price shall apply to pavement of any thickness (both bituminous and concrete).

REMOVE SIDEWALK

(Bid Item)

The completed work as measured for REMOVE SIDEWALK will be paid for at the contract unit price for the following contract item (pay item):

<u>Pay Item</u>	<u>Pay Unit</u>
Sidewalk, Rem	square yard

Concrete sidewalk removal shall be measured in place by area in square yards. The removal area shall be based upon the average length and width measurements as determined in the field by the Engineer.

The contract unit price shall be payment in full for all labor, material and equipment required to sawcut, remove, and properly dispose of the sidewalk off site. The contract unit price shall apply to sidewalk of any thickness.

EXPLORATORY EXCAVATION

(Bid Item)

The completed work as measured for EXPLORATORY EXCAVATION will be paid for at the contract unit price for the following contract item (pay item):

<u>Pay Item</u>	<u>Pay Unit</u>
Exploratory Excavation	each

Exploratory Excavation shall be paid for per test hole dug. The work consists of excavating test holes in order to expose existing public water main, sanitary sewer, storm sewer, sewer leads, water services, or any other buried utility lines, and determining if there will be possible construction conflicts between existing and proposed utilities.

The contract unit price shall be payment in full for all labor, materials, and equipment necessary to dig test holes and shall include excavation, measurements as necessary, backfill, compaction, and restoration. The

Contractor shall coordinate with the Engineer regarding test hole locations in advance of construction in order to allow for possible design changes due to conflicts.

Exploratory Excavation shall be paid only if authorized by the Engineer. Any test hole dug without consent of the Engineer will be done at the Contractor's expense.

Exploratory Excavation will not be paid for test holes dug to locate existing utilities in the path of directional drilling.

EARTHWORK

(Bid Item)

The completed work as measured for EMBANKMENT and EXCAVATION will be paid for at the contract unit price for the following contract item (pay item):

<u>Pay Item</u>	<u>Pay Unit</u>
Embankment, LM	cubic yard
Excavation, Earth	cubic yard

The contract unit price shall be payment in full for all labor, materials, and equipment necessary to perform all earthwork necessary for the construction of the project.

The contract unit price shall include items such as excavating, grading, and compacting earth as well as stockpiling and finish grading. Furnishing, grading, and compacting suitable embankment material as well as removing excess or unsuitable material shall also be considered as part of project earthwork. Earthwork items shall only apply to locations clearly indicated on the project plans and specifications.

BORE PIT

(Bid Item)

The completed work as measured for BORE PIT will be paid for at the contract unit price for the following contract item (pay item):

<u>Pay Item</u>	<u>Pay Unit</u>
Bore Pit	Each

The contract unit price shall be payment in full for all labor, materials, and equipment necessary to perform all work necessary for set up and removal of the bore pits.

The contract unit price shall include items such as excavating, shoring, grading, and compacting earth as well as stockpiling material and finish grading of bore pit areas. Furnishing, grading, and compacting suitable backfill material as well as removing excess or unsuitable material shall also be considered incidental to the item Bore Pit.

GRADING

(Bid Item)

The completed work as measured for GRADING will be paid for at the contract unit price for the following contract item (pay item):

<u>Pay Item</u>	<u>Pay Unit</u>
Shared Use Path, Grading	ft

Grading shall be measured along the construction centerline of pathway from point of beginning to point of ending. Measurements shall not extend driveways, or through intersections.

The contract unit price shall be payment in full for all labor, materials, and equipment necessary to perform the earthwork and related items of work as outlined in the Supplemental Specifications.

SUBGRADE UNDERCUT, TYPE II (MODIFIED)

(Bid Item)

The completed work as measured for SUBGRADE UNDERCUT, TYPE II (MODIFIED) will be paid for at the contract unit price for the following contract item (pay item):

<u>Pay Item</u>	<u>Pay Unit</u>
Subgrade Undercutting, Type II (Modified)	cubic yard

Subgrade undercut and refill shall be measured in place and shall be based upon the average length, width, and depth measurements of the undercut area as determined by the Engineer. Undercut areas that are not authorized or measured by the Engineer will not be considered for payment.

The contract unit price shall be payment in full for all labor, materials, and equipment necessary to undercut and dispose of the unsuitable material and then backfill the undercut area with compacted MDOT 21AA limestone, unless otherwise called for on the plan details.

SUBGRADE UNDERCUT, TYPE II (SPECIAL)

(Bid Item)

The completed work as measured for SUBGRADE UNDERCUT, TYPE II (SPECIAL) will be paid for at the contract unit price for the following contract item (pay item):

<u>Pay Item</u>	<u>Pay Unit</u>
Subgrade Undercutting, Type II (Special)	cubic yard

Subgrade undercut and refill shall be measured in place and shall be based upon the average length, width, and depth measurements of the undercut area as determined by the Engineer. Undercut areas that are not authorized or measured by the Engineer will not be considered for payment.

The contract unit price shall be payment in full for all labor, materials, and equipment necessary to undercut and dispose of the unsuitable material and then back fill the undercut area with compacted 1" x 3" stone or crushed concrete, unless otherwise called for on the plan details.

AGGREGATE BASE COURSE

(Bid Items)

The completed work as measured for AGGREGATE BASE COURSE will be paid for at the contract unit price for the following contract item (pay item):

<u>Pay Item</u>	<u>Pay Unit</u>
Aggregate Base, 8 inch, Modified	syd
Aggregate Base, 4 inch, Modified	syd
Maintenance Gravel, LM	ton

Aggregate Base shall be measured in place by square yards and the area shall be based upon the aggregate base length and width measurements as determined by the Construction Observer. Aggregate Base and Maintenance Aggregate shall be measured in tons based upon certified weight delivery tickets. All aggregate and maintenance gravel materials shall be **limestone**, no crushed concrete will be allowed.

The contract unit price shall be payment in full for all labor, materials, and equipment necessary to place, grade, and compact the aggregate base course materials. Any earth excavation, subgrade preparation, or material disposal that is required for the aggregate base course placement shall be considered as incidental to the work unless separate pay items have been included in the bid form for earthwork.

Maintenance aggregate shall be used at various locations for temporary maintenance of local traffic and shall be considered for payment only where authorized by the Construction Observer. Removal of the maintenance aggregate shall be considered as incidental to the permanent placement work.

STRUCTURE RECONSTRUCT

(Bid Item)

Payment for STRUCTURE, RECONSTRUCT will be made on the basis of unit price for the following contract item (pay item):

<u>Pay Item</u>	<u>Pay Unit</u>
Structure, Reconstruct	vertical foot

Payment shall include all labor, tools, equipment, and materials required to remove and reconstruct structure in accordance with the City's standard details and as directed by the Construction Observer. This pay item shall be paid by the vertical foot, and measured to the nearest tenth of a foot from the bottom of the reconstructed section to the top of the reconstructed section.

This pay item shall include the saw cutting, removal and disposal of pavement, and excavation as required to complete the removal and reconstruction of the structure. Removal of the existing cone, resetting of the existing cone, backfilling the excavated area with compacted 21AA limestone aggregate. Minimum of 8 inch block shall be used. Where possible, precast sections shall be used. Resetting and replacing the frame and cover is incidental to Structure, Reconstruct.

ADJUST STRUCTURE

(Bid Item)

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

<u>Pay Item</u>	<u>Pay Unit</u>
Adjust Drainage/Utility Structure	each
Adjust Sanitary Structure	each

The work of adjusting structures shall be paid for on a per structure basis and shall apply when the total amount of vertical change of the casting (up or down) is six inches or less. Additional vertical change beyond six inches shall be paid for as Structure, Reconstruct. The pay item for adjusting drainage/utility structures shall apply to existing storm manholes, catch basins, inlets, and gate wells. The pay item for adjusting sanitary structures shall apply only to existing sanitary manholes. The adjust structure pay item shall not apply to new structures since final adjustment in this case is included in the contract unit price of the new structure. The adjust structure pay item shall also not apply to water valve boxes and shutoffs as this work shall be seen as incidental.

The contract unit price shall be payment in full for all labor, material (**installation of new WrapidSeal™ is incidental to adjust sanitary structure**), and equipment necessary to adjust structures in accordance with the plan details so that the castings will match the new finished pavement or landscape surface grades. Excavation, backfill, cleaning the existing casting and disposal of excess or unsuitable materials shall all be considered as included as part of the adjustment work.

STORM STRUCTURES (CATCH BASINS AND MANHOLES)

(Bid Item)

The completed work as measured for CATCH BASINS AND MANHOLES will be paid for at the contract unit price for the following contract items (pay items):

<u>Pay Item</u>	<u>Pay Unit</u>
Dr Structure, ___ inch dia	each

The contract unit price shall be payment in full for all labor, materials and equipment necessary to construct the storm structure. Each storm structure shall be complete with base, steps, frames and covers, stubs, pipe opening, channels, and sumps (where appropriate) as called for in the plan details. Payment for storm structures shall include the following (except such items for which separate prices are received on the bid form): excavating; disposal of unsuitable or excess excavated materials; temporary sheeting, bracing and shoring of excavations; support, relocation, replacement, connection or reconnection of existing pipe lines, building leads and utilities; furnishing and placing of structure, jointing materials, fittings, bulkheads, and plugs; cleaning; furnishing and placing of required bedding, backfill and fill materials; final adjustment or reconstruction of casting to finished grade; complete cleanup and surface restoration. Payment will be the same for standard and low head structures of the same diameter. Payment will also be the same for storm manholes of the same diameter both with and without sumps. Removal of an existing storm structure shall be considered as included in the price for the new storm structure construction if the new storm structure is being constructed in the same location as the existing structure.

The contract unit price shall also include payment in full for dewatering of the excavation as described in the Earthwork section. The contract unit price does not include dewatering by means of deep wells or well points. In the event that dewatering by means of deep wells or well points is required, as determined by the Engineer, then this work shall be paid for separately.

HOT MIX ASPHALT (HMA) PAVEMENT

(Bid Item)

The completed work as measured for HOT MIX ASPHALT (HMA) PAVEMENT will be paid for at the contract unit price for the following contract items (pay items):

<u>Pay Item</u>	<u>Pay Unit</u>
HMA, 5E_,	ton
HMA, 5E_, 2 inch	square yard
HMA, 4E_, 2 inch	square yard
Shared Use Path, HMA	ton

HMA pavement for hand patching, pathway, and temporary pavement shall be measured in tons based upon certified weight delivery tickets.

HMA pavement construction for other items of paving work, such as roadways, parking areas and driveway approaches shall be measured in place by square yards and shall be based upon the pavement length and width measurements as determined by the Engineer. Longitudinal measurements shall be made along the centerline of pavement from end to end. Transverse measurements shall extend from edge of pavement to edge of pavement. The Contractor must provide certified weight delivery tickets to the Construction Observer.

The contract unit price shall be payment in full for all labor, materials, and equipment necessary to construct the HMA pavement in accordance with the plan details. Furnishing and applying bond coats, pavement compaction, and protection of the work shall all be considered as incidental to HMA pavement construction. For bike, safety, or shared use path paving, the contract unit price shall also include the application of a suitable soil sterilant (Pramitol 25E or approved equal) on the Subgrade prior to paving. The application method and coverage rate shall be in accordance with the manufacturer's recommendations.

CONCRETE PAVEMENT

(Bid Item)

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

<u>Pay Item</u>	<u>Pay Unit</u>
Driveway, Nonreinf Conc, 8 inch	square yard

Concrete pavement shall be measured in place by square yards and the area shall be based upon the pavement length and width measurements as determined by the Engineer. Longitudinal measurements shall be made along the centerline of pavement from end to end. Transverse measurements shall extend from edge of pavement to edge of pavement. If the concrete pavement has an integral curb, then the transverse

measurement shall extend to the back of curb so that the integral curb is included in the pavement area calculation.

Pay items that are designated as "driveway" shall apply to driveway approach paving work. Curb returns in drive approaches shall be considered incidental to "driveway" pay items. Pay items that have no designation shall apply to main line road paving.

The contract unit price shall be payment in full for all labor, materials, and equipment necessary to form, place, cure, and protect the concrete pavement in accordance with the plan specifications. Concrete pavement joints and joint sealing shall be considered as included in the pavement construction. Backfilling behind curbs or along pavement edges shall also be considered as incidental to the concrete pavement construction.

CONCRETE CURB & GUTTER

(Bid Item)

The completed work as measured for CONCRETE CURB & GUTTER will be paid for at the contract unit price for the following contract items (pay items):

<u>Pay Item</u>	<u>Pay Unit</u>
Curb & Gutter, Conc, Det ____	feet
Driveway Opening, Conc, Detail M	feet

Concrete curb & gutter shall be measured in place by linear feet. The length shall be measured along the gutter line from end of curb to end of curb. Curb endings and curb drops shall all be measured and paid for as concrete curb and gutter, detail F2. Curb integral to approaches shall be paid for as Driveway, Nonreinf Conc, 8 inch, and shall not be paid separately as Curb & Gutter.

The contract price shall be payment in full for all labor, materials, and equipment necessary to construct the concrete curb and gutter in accordance with the plan details. Any excavation, subgrade compaction, backfilling behind the curb, disposal of excess materials, joints, curing compound, and placement of curb drops shall be considered as incidental to the curb and gutter construction.

DETECTABLE WARNING

(Bid Items)

The completed work as measured for DETECTABLE WARNING will be paid for at the contract unit price for the following contract item (pay item):

<u>Pay Item</u>	<u>Pay Unit</u>
Detectable Warning Surface	foot

Detectable Warning shall be measured along the in place panel, in the case where multiple panels are required to complete a radius the measurement shall be made on the installed materials (not including waste) used to complete the radius. The contract unit price shall include all labor, material, and equipment necessary to install a detectable warning strip in the concrete ramp. The detectable warning strips shall be **Safety Yellow** (Federal Color No. 33538) in color. The detectable warning, surface tiles shall be

manufactured by one of the following approved manufacturers, or an alternate source may be proposed to the Engineer for approval:

ADA Solutions, Inc.	(800) 327-0519
Engineered Plastics, Inc.	(800) 682-2525
Metadome, LLC	(608) 249-8644

No painted/stamped concrete detectible warning strips shall be allowed. Ramps shall be constructed per the latest edition of MDOT standard plans R-28 Series.

CONCRETE SIDEWALK

(Bid Item)

The completed work as measured for CONCRETE SIDEWALK will be paid for at the contract unit prices for the following contract items (pay items):

<u>Pay Item</u>	<u>Pay Unit</u>
Sidewalk Ramp, Conc, 6 inch	square foot
Sidewalk, Conc, 4 inch	square foot

Concrete sidewalk shall be measured in place and shall be paid for based upon the length and width measurements of the sidewalk area as determined by the Engineer.

The contract unit price shall be payment in full for all labor, materials, and equipment necessary to construct sidewalk of the required thickness in accordance with the plan details. Furnishing, placing, and compacting a 4-inch thick aggregate base shall be considered as incidental to the sidewalk placement. Any necessary excavation, backfill, and disposal of excess materials shall also be considered as incidental to the sidewalk construction.

PAVEMENT MARKINGS

(Bid Item)

The completed work as measured for PAVEMENT MARKINGS will be paid for at the contract unit prices for the following contract items:

<u>Pay Item</u>	<u>Pay Unit</u>
Pavt Mrkg, Polyurea, 4 inch, Yellow	feet

Pavement striping and recessing shall be measured in place horizontally by linear feet. The length shall be measured along the painted segment from end to end of paint marks. Pavement marking symbols and legends shall be counted and paid for by each.

The contract unit price shall be payment in full for all labor, materials, and equipment necessary to furnish, recess and install the pavement markings in accordance with the plan details and the manufacturer's instructions. All sweeping and preparatory work as well as traffic control and temporary protection of newly placed markings shall be considered as incidental to the pavement marking work. Removal of any temporary pavement markings shall also be considered as incidental unless the Bid Form already includes pay items for removing temporary markings.

SURFACE RESTORATION

(Bid Item)

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

<u>Pay Item</u>	<u>Pay Unit</u>
Turf Establishment, Performance	square yard

Surface Restoration with seed or sod shall be measured in place by square yards and shall be based upon the average length and width measurements of the restored area as determined by the Construction Observer.

The contract unit price shall be payment in full for all labor, materials, and equipment necessary to furnish and place the topsoil, seed, and mulch or topsoil and sod as called for on the plans and specifications. Watering seed or sod until vigorous turf growth is established shall be considered as incidental to the surface restoration work unless a separate pay item for water is included in the Bid Form. Contractor shall perform 2 cuts prior to requesting acceptance.

Application of mulch anchoring shall be considered as incidental to the placement of the mulch unless a separate pay item for the mulch anchoring has been included in the Bid Form.

FIRE HYDRANT

(Bid Item)

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

<u>Pay Item</u>	<u>Pay Unit</u>
Fire Hydrant	each

The contract unit price shall be payment in full for all labor, materials and equipment necessary to construct the Fire Hydrant assembly complete as shown on the plan details. Payment for Fire Hydrants shall include the following (except such items for which separate prices are received on the bid form): excavating; disposal of unsuitable or excess excavated materials; temporary sheeting, bracing and shoring of excavations; support, relocation, replacement, connection or reconnection of existing pipe lines, and utilities; furnishing and placing of fire hydrant, water main pipe, jointing materials, restrained joints, companion shut off valve and box, fittings, bend, bulkheads, plugs, and thrust blocks; cleaning; furnishing and placing of required bedding, backfill and fill materials; complete cleanup and surface restoration. The unit price for fire hydrants shall include all work from the water main to the location where the hydrant assembly is placed.

The contract unit price shall also include payment in full for dewatering of excavation as described in the Earthwork section. The contract unit price does not include dewatering by means of deep wells or well points. In the event that dewatering by means of deep wells or well points is required, as determined by the Engineer, then this work shall be paid for separately.

WATER MAIN

(Bid Item)

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

<u>Pay Item</u>	<u>Pay Unit</u>
Water Main, CL 54 DI, 12 inch	feet
Water Main, CL 54 DI, 8 inch	feet
Water Main, CL 54 DI, 6 inch	feet
Water Main, C900, 8 inch, open cut	feet
Water Main, HDPE DR-11, 14 inch, Direction Drill	feet

Water main shall be measured in place horizontally by linear feet along the centerline of the pipe from center of end fittings or end-to-end, without deduction for intervening valves, gate wells or structures.

The contract unit price shall be payment in full for all labor, materials and equipment necessary to construct the water main. Payment for Water Main shall include the following (except such items for which separate prices are received on the bid form): excavating; trenching; installation of tracing wire per plan details; disposal of unsuitable or excess excavated materials; temporary sheeting, trench boxes, bracing and shoring of excavations; support, relocation, replacement, connection or reconnection of existing pipe lines, building leads and utilities; furnishing and placing of pipe, polyethylene encasement, jointing materials, fittings, bulkheads, plugs, sleeves, adaptors, joint restraint, corporation stops, necessary thrust blocks, connections to existing mains, blow-offs, flushing, cleaning, chlorination, sterilization, hydrostatic and bacteriological testing, furnishing and placing of required bedding, backfill and fill materials, complete cleanup and surface restoration.

Payment for water main shall also include up to 18 inches of trench undercut and refill with compacted MDOT 6A crushed gravel or 6A crushed concrete unless otherwise shown in the plan details. If additional undercut is required beyond 18 inches then it shall be paid for separately as Trench Undercut and Refill.

C900 pipe shall be restrained joint per AWWA standards. **2 tracing wires shall be pulled with non-ductile iron pipe.**

Sand backfill shall be considered incidental to the water main pay items.

No additional payment will be made for fusing, transitions, thrust anchors, etc. related to directional boring the HDPE pipe and installing it per City and AWWA standards. Included in this pay item, Contractor shall survey (with a licensed surveyor, if required by MDOT) the pavement surface of M-59 before and after construction per MDOT standard guidelines for boring under highway right-of-way. Additional payment shall not be made for traffic control on M-59 for the required running line survey. **2 tracing wires shall be pulled with non-ductile iron pipe.**

The contract unit price shall also include payment in full for dewatering of excavation as described in the Earthwork section. The contract unit price does not include dewatering by means of deep wells or well points. In the event that dewatering by means of deep wells or well points is required, as determined by the Engineer, then this work shall be paid for separately.

GATE VALVE AND WELL

(Bid Item)

The completed work as measured for GATE VALVE and WELL will be paid for at the contract unit price for the following contract items (pay items):

<u>Pay Item</u>	<u>Pay Unit</u>
Gate Valve and Well, __ inch	each
Gate Valve __ inch, and Well, __ inch	each

The contract unit price shall be payment in full for all labor, materials and equipment necessary to construct the gate valve and well. Each well shall be complete with base, steps, frames and covers, stubs, and pipe openings. Payment for Gate Valves and Wells shall include the following (except such items for which separate prices are received on the bid form): excavating; disposal of unsuitable or excess excavated materials; temporary sheeting, bracing and shoring of excavations; support, relocation, replacement, connection or reconnection of existing pipe lines, and utilities; furnishing and placing of structure, jointing materials, valve, corporation stops, fittings, tees, reducers, bulkheads, and plugs; cleaning; furnishing and placing of required bedding, backfill and fill materials; complete cleanup and surface restoration.

Unless otherwise noted, Gate Wells shall be dimensioned per City standards.

The contract unit price shall also include payment in full for dewatering of excavation as described in the Earthwork section. The contract unit price does not include dewatering by means of deep wells or well points. In the event that dewatering by means of deep wells or well points is required, as determined by the Engineer, then this work shall be paid for separately.

PRV COMPLETE

(Bid Item)

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

<u>Pay Item</u>	<u>Pay Unit</u>
PRV Complete	LSUM

The contract unit price shall be payment in full for all labor, materials and equipment necessary to construct the PRV, vault, and associated valves, tee's, gate wells, reducers, etc. Payment for PRV Complete shall include the following: excavating; trenching; disposal of unsuitable or excess excavated materials; temporary sheeting, bracing and shoring of excavations; support, relocation, replacement, connection or reconnection of existing pipe lines, building leads and utilities; furnishing and placing of pipe, jointing materials, fittings, plugs, adaptors, joint restraint, corporation stops, water stop boxes, installation of sump well, sump pump and sump lead; cleaning and testing; sterilization; furnishing and placing of required bedding (1-foot) as shown on the plans (undercuts, if required, will be paid for separately with Subgrade, Undercut Type II/II Special), backfill and fill materials; and installation of all internal vault components shown on the plans and specifications. Coordination with the City's SCADA provider and installation of said system, including transmitter is incidental to item PRV Complete. 5x5 hatch shall be stainless steel and H20/HS20 load rated.

ELECTRICAL COMPLETE

(Bid Item)

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

<u>Pay Item</u>	<u>Pay Unit</u>
Electrical Complete	LSUM

The contract unit price shall be payment in full for all labor, materials and equipment necessary to construct the Electrical components shown on the plans, including conduit, wiring, fittings, lights, fans, etc. Payment for Electrical Complete shall include the following: excavating; trenching; disposal of unsuitable or excess excavated materials; temporary sheeting, bracing and shoring of excavations; support, relocation, replacement, connection to existing power source, installation of electrical panel, breakers, circuit panel, concrete pad, etc., and installation of all components shown on the electrical plan sheets and details.

ELECTRICAL ALLOWANCE (DTE)

(Bid Item)

The completed work as measured for ELECTRICAL ALLOWANCE (DTE) will be paid for at the contract unit price for the following contract items (pay items):

<u>Pay Item</u>	<u>Pay Unit</u>
ELECTRICAL ALLOWANCE (DTE)	LSUM

The contract unit price shall be payment in full for all labor, materials, time and equipment necessary to coordinate electrical service connection with DTE.

CONNECTION TO EXISTING WATER MAIN

(Bid Item)

The completed work as measured for CONNECTION TO EXISTING WATER MAIN will be paid for at the contract unit price for the following contract item (pay item):

<u>Pay Item</u>	<u>Pay Unit</u>
Connection to Existing Water Main	each

The contract unit price shall be payment in full for all labor, materials and equipment necessary to connect the new water main to the existing water main in accordance with the plan details. This pay item would apply to connections made to existing water mains at existing stubs or by cutting in tees. 10' of removal is included in connection to existing water main. Payment for Connection to Existing Water Main shall include the following (except such items for which separate prices are received on the bid form): excavating; disposal of unsuitable or excess excavated materials; temporary sheeting, bracing and shoring of excavations; support, relocation, replacement, connection or reconnection of existing pipe lines, building leads and utilities; furnishing and placing of pipe, jointing materials, fittings, bulkheads, plugs, sleeves, adaptors, joint restraint, corporation stops, necessary thrust blocks; connections to existing mains; cleaning

and testing; sterilization; furnishing and placing of required bedding, backfill and fill materials; complete cleanup and surface restoration.

The contractor shall not receive payment for this item if the connection to an existing main is made by means of a tapping sleeve, valve and well.

The contract unit price shall also include payment in full for dewatering of excavation as described in the Earthwork section. The contract unit price does not include dewatering by means of deep wells or well points. In the event that dewatering by means of deep wells or well points is required, as determined by the Engineer, then this work shall be paid for separately.

Water main connections may be required to be done after hours or on the weekend. The Rex Blvd Connection is expected to be performed after hours or on the weekend. Work required to be performed after hours or on the weekend by the Contractor shall be considered incidental to the construction of the project and this item.

The driveway crossing for the water main extension at Old Adams may be required to be done after hours or on the weekend. Coordination will be required by the contractor with Consumers Energy. Work required to be performed after hours or on the weekend by the contractor shall be considered incidental to the construction of the project.

REMOVE GATE WELL, HYDRANT, SERVICE, AND WATER MAIN

(Bid Item)

The completed work as measured for REMOVE GATE WELL, HYDRANT, SERVICE AND WATER MAIN will be paid for at the contract unit price for the following contract items (pay items):

<u>Pay Item</u>	<u>Pay Unit</u>
Remove Gate Well	each
Remove Hydrant	each
Remove Water Service Lead	each
Remove Water Main	foot

The contract unit price shall be payment in full for all labor, materials, and equipment necessary to remove water main, services, gate wells, or hydrants as called for on the plans.

Gate well removal shall include removing and salvaging the casting and gate valve as well as complete removal and disposal of the gate well structure. If the Owner wishes to retain the salvaged casting or gate valve, then the contractor shall deliver these items to the Owner's storage yard. Otherwise, the contractor shall be responsible for disposal of the unwanted castings and valves.

Hydrant removal shall include removing the hydrant assembly and valve back to the existing water main tee. Removal work shall also include placement of approved caps or plugs and thrust blocks on the open end of the tee. If the Owner wishes to retain the hydrant assemblies, then the Contractor shall deliver the salvaged hydrants to the Owner's storage yard. Otherwise the contractor shall be responsible for disposal of the unwanted hydrant assemblies.

Water service lead removal shall include removing the existing water service lead from the water main up to the property line or easement line. The payment shall include any necessary earth excavation, removing

and disposing of the service lead, removing and disposing of the curb stop and box, and capping the lead at the main and property line. Furnishing, placing, and compacting any necessary backfill shall be considered as included as part of the service lead removal work. The payment shall be the same regardless of the lead size or lead material. This item shall only apply if a water service lead is to be removed and not replace.

Water main removal shall include removing the existing AC water main and concrete water main and properly disposing of the water main per MDOT standards. The payment shall include all safety measures, preparation and coordination, sawcutting of the existing water main, and proper removal of the water main from the site per standard. The payment shall be the same regardless of the water main size.

Where existing thrust blocks will interfere with the placement of new utilities, then the thrust blocks shall be removed as incidental to the to the water main removal work.

Excavation as well as furnishing, placing, and compacting suitable backfill shall be considered as included in all of the removal work. Furnishing and placing caps and/or plugs and necessary thrust blocks on the remaining water main ends after the removals are complete shall also be considered as included as part of the removal work unless a separate pay item is included in the Bid Form to cap water main.

ABANDON WATER MAIN

(Bid Item)

The completed work as measured for ABANDON WATER MAIN will be paid for at the contract unit price for the following contract item (pay item):

<u>Pay Item</u>	<u>Pay Unit</u>
Water Main, Pressure Grout	lump sum

The contract unit price shall be payment in full for all labor, materials, and equipment necessary to abandon water main by cutting, plugging, and administering **pressure grouted** flowable fill.

The contract unit price for cutting and plugging water main for abandonment shall include furnishing and placing caps on all open ends of water main after various water main appurtenances have been removed. Any excavation necessary to place the caps as well as furnishing, placing and compacting suitable backfill shall be considered as included in the water main abandonment work. Removals of water main or appurtenances such as hydrants and gate valves shall be paid for separately. The pressure grouted flowable fill material and operation must approved by the Engineer.

WATER SERVICES

(Bid Item)

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

<u>Pay Item</u>	<u>Pay Unit</u>
Water Serv	each

Water Services shall be measured by each for each connection between an existing service and the new water main.

The contract unit price shall be payment in full for all labor, materials and equipment necessary to construct the water service. Payment for Water Services shall include the following (except such items for which separate prices are received on the bid form): excavating; trenching; disposal of unsuitable or excess excavated materials; temporary sheeting, bracing and shoring of excavations; support, relocation, replacement, connection or reconnection of existing pipe lines, building leads and utilities; furnishing and placing of pipe, jointing materials, fittings, plugs, adaptors, joint restraint, corporation stops, water stop boxes, tapping water main, connection to existing services; boring or pulling in place where service is installed under existing pavement; cleaning and testing; sterilization; furnishing and placing of required bedding, backfill and fill materials; complete cleanup and surface restoration.

Payment for water services shall also include up to 18 inches of trench undercut and refill with MDOT 6A crushed gravel or 6A crushed concrete unless otherwise shown in the plan details. If additional undercut is required beyond 18 inches then it shall be paid for separately as Trench Undercut and Refill.

The designation "Trench G" shall indicate compacted sand backfill (MDOT Class II) for the trench in accordance with the plan details. "Trench F" shall indicate suitable, job-excavated material for trench backfill.

The contract unit price shall also include payment in full for dewatering of excavation as described in the Earthwork section. The contract unit price does not include dewatering by means of deep wells or well points. In the event that dewatering by means of deep wells or well points is required, as determined by the Engineer, then this work shall be paid for separately.

REMOVE BOLLARD

(Bid Item)

The completed work as measured for REMOVE BOLLARD will be paid for at the contract unit price for the following contract item (pay item):

<u>Pay Item</u>	<u>Pay Unit</u>
Remove Bollard	each

The contract unit price shall be payment in full for all labor, materials and equipment necessary to remove the bollard and foundations. Furnishing, placing, and compacting suitable backfill in the old foundation holes as well as disposal of the foundation and bollards offsite shall be considered as included in the removal work.

IRRIGATION REPAIR

(Bid Item)

The completed work as measured for IRRIGATION REPAIR will be paid for at the contract unit price for the following contract item (pay item):

<u>Pay Item</u>	<u>Pay Unit</u>
Irrigation Repair	lump sum

Payment for Irrigation items includes equipment, labor and materials to complete this item as specified above and as detailed in the supplemental specification. Contractor shall contact owner of irrigation system prior to beginning project work, and verify irrigation system location and condition. .

Costs for connecting, testing and adjusting the completed work will be included in the Contract unit prices for the above items. Contract lump sum price for the above irrigation item shall also include cost of furnishing and all necessary pipe, heads, materials and fittings, and for all necessary excavation, backfilling and disposal of surplus material. All necessary components to complete the work shall be provided by the Contractor, but those not a designated as contract pay item will not be paid for separately.

PROJECT CLEANUP

(Bid Item)

The completed work as measured for PROJECT CLEANUP will be paid for at the contract unit price for the following contract item (pay item):

<u>Pay Item</u>	<u>Pay Unit</u>
Project Cleanup	lump sum

Project cleanup shall be paid for on a lump sum basis.

The contract unit price shall be payment in full for all labor, materials, and equipment necessary to remove and properly dispose of all debris from the work zone. The cleanup work shall include, but not be limited to, sweeping of paved surfaces as well as removal of debris such as old fencing, bricks, broken concrete, trash, logs, rocks, fallen timber, brush, and scrap materials. Cleaning and vactoring out of all culverts, sewers, and structures shall also be considered as included in the project clean up work.

CREW DAYS

(Bid Item)

1. CREW DAYS All construction operations will require full time observation by the OWNER's representative. Construction observation is shown in the Bid Form as a bid item on the basis of Crew Days. This item is included in the Bid Form in order to expedite construction and ensure the CONTRACTOR's expedient pursuit of completion of the Contract.
2. The Bid Form lists the unit cost for Crew Days. The CONTRACTOR is directed to fill in the number of days required to complete the project, with any adjustments for the number of crews working, etc. and extend this item.
3. A Crew Day is defined as one technician working eight (8) hours. Additional hours over and above eight (8) hours per day will be charged one-quarter (0.25) of a Crew Day for each two (2) hours or part thereof.
4. The CONTRACTOR shall notify both the ENGINEER and the OWNER a minimum of seventy-two (72) hours prior to any work being performed. If the CONTRACTOR should move off-site for a period of more than two days, excluding weekends and holidays, both the ENGINEER and OWNER shall be notified. The CONTRACTOR shall then notify both the ENGINEER and OWNER a minimum of forty-eight (48) hours prior to returning to the site.
5. If work is stopped due to inclement weather, observation time charged will be for actual time on the job, but not less than four (4) hours. If the work is stopped after 3:00 p.m., the charge for observation will be one Crew Day.
6. If the CONTRACTOR stops work for any reason and fails to notify the ENGINEER's office of such, resulting in the technician being sent to the work site, four (4) hours minimum crew time shall accrue directly to the CONTRACTOR.
7. The cost of show-up time shall be at the CONTRACTOR's expense and shall be deducted from monies owed to the CONTRACTOR. Observation time resulting from the CONTRACTOR's failure to notify the ENGINEER's office shall not accrue against the Crew Days bid.
8. Notification shall be given to the technician before the technician leaves the work site the day prior to work stoppage or to the ENGINEER's office before 5:00 p.m. the day prior to the work stoppage.
9. **If more than one technician is required due to working schedule, number of crews, distance of operation, etc., additional technicians will be provided at the stated rate. One crew day is required per technician for each crew. Example: 3 technicians with 3 crews all working on the same day equals 3 crew days.**
10. As Crew Days are used, the costs will be deducted from the item "Crew Day" amount until completion of the Contract via periodic estimates due to the CONTRACTOR. The cost is the number of days used multiplied by the daily rate in the Bid Form.
11. After all the money in the item "Crew Day" is depleted, the incurred observation costs shall be deducted from periodic Contract pay estimates due to the CONTRACTOR.

12. The CONTRACTOR will not be paid for any unused days if a positive balance of days is left in the "Crew Day" item at the end of the project.

MATERIAL STOCKPILING

Contractor shall remove excavated materials from within the road right of way by the end of each work day. If an excavations need to remain open overnight the Contractor must secure the area with 5 foot high orange safety fence or similar, secured to fence posts around the perimeter of the opening.

MISCELLANEOUS RESTORATION ITEMS

Restoration of miscellaneous items such as, but not limited to, street signs, traffic signs, shrubbery and other ornamental landscape items which are damaged, removed, or destroyed by the Contractor in the course of the work shall be repaired or replaced by the Contractor with new materials of equal quality as existed prior to the start of work. All such items for which specific bid items are not listed in the proposal shall be considered as incidental work and shall be replaced or repaired at the expense of the Contractor.

RELOCATE OR BRACE UTILITY POLES AND GUY WIRES

The cost of relocating or bracing utility poles and guy wires, including all labor, materials, machinery and equipment, shall be considered incidental to the project and no extra payment shall be made for such work.

PRIVATE UTILITY ADJUSTMENT

Adjustment and/or relocation of private utility structures such as gas valves, structure covers, riser boxes, etc. shall be considered as incidental to the project. The Contractor shall furnish all labor, materials, tools, and equipment required to adjust private utility structures to the finished elevations. If private utility structures are to be adjusted and/or relocated by their respective owners, then the Contractor shall be responsible for coordinating this work with the private utility owner as incidental to the project.

EASEMENT CONDITIONS

The Contractor shall be required to review and comply with easement conditions that are shown on the plans or contract documents. Compliance with easement conditions shall be considered as incidental to the overall project cost.

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1. GENERAL

These Supplemental Specifications are supplements to the General Conditions and General Specifications. Where conflicts exist between the aforementioned Contract Documents, the conditions in the Supplemental Specifications shall govern.

2. LOCATION OF PROJECT

The project sites are located within the City of Auburn Hills:

Hillfield Water Main Connection – Connection of water main from Executive Hills Blvd to Hillfield Rd.

Rex Blvd Water Main Replacement – Replacement of water main at 270 Rex Blvd.

Old Adams Water Main Extension – Extension of water main along Old Adams Road.

3. SCOPE OF PROJECT

The work to be done under this Contract includes the furnishing of all materials, equipment, and labor necessary to construct the proposed water main as well as all necessary earthwork, cleaning, and restoration in accordance with the plans and specifications.

4. CONSTRUCTION STANDARDS

It is the intention of these specifications to construct all work in accordance with applicable requirements of the City of Auburn Hills, the Road Commission of Oakland

County, and the Michigan Department of Transportation, these specifications, and the details referenced herein. Where there is a conflict between any of the aforementioned specifications and the permit requirements of the agency controlling the respective utility or rights-of-way, the more restrictive shall govern.

5. INCIDENTAL CONTRACT ITEMS

All items of work noted on the details or in the specifications that are not specifically noted in the Bid Form as a pay item shall be considered incidental to the construction of the project and shall be constructed at no extra cost to the OWNER.

6. PROJECT COORDINATION WITH OWNER & OTHER CONTRACTORS

The OWNER, utility companies, and commercial or private owners may have construction projects occurring within or adjacent to the project limits during the life of this Contract.

The CONTRACTOR shall coordinate his construction with all such projects that may be ongoing in the vicinity.

Also, where the CONTRACTOR's work affects the operation of the OWNER's utilities, the CONTRACTOR shall be responsible for coordinating his work with the OWNER. Contact Jason Deman at (248) 391-3777. The CONTRACTOR shall give at least 72 hours' notice to the OWNER in order to schedule activities such as valve operation, hydrant operation, sewer and structure cleanout, etc. No claim for extra compensation or adjustments in Contract Unit Prices will be allowed on account of delay or failure of others to complete work scheduled.

7. FAIR EMPLOYMENT PRACTICES ACT

The CONTRACTOR agrees that neither he nor his subcontractors will discriminate against any employee or applicant for employment. The CONTRACTOR shall not discriminate with respect to his hire, tenure, terms, conditions or privileges of employment, or any matter directly or indirectly related to employment, because of race, color, religion, national origin or ancestry, nor shall age or sex be a condition of employment except where based upon an occupational qualification. Breach of these covenants may be regarded as a material breach of this Contract.

8. OBSERVATION OF CONSTRUCTION

All construction operations will require full time observation by the OWNER's representative. The CONTRACTOR must notify the ENGINEER at least three (3) working days (72 hours) prior to construction and no work shall be performed without the ENGINEER's presence or awareness. Contact the Construction Coordinator at (734) 522-6711 to schedule observation.

9. HOURS OF WORK

Work may be performed during the hours of 7:00 a.m. to 7:00 p.m., Monday through Saturday only. Work at other times may be performed only by written permission of the OWNER.

Water main connections may be required to be done after hours or on the weekend. The Rex Blvd Connection is expected to be performed after hours or on the weekend. Work required to be performed after hours or on the weekend by the CONTRACTOR shall be considered incidental to the construction of the project.

The driveway crossing for the water main extension at Old Adams may be required to be done after hours or on the weekend. Coordination will be required by the CONTRACTOR with Consumers Energy. Work required to be performed after hours or on the weekend by the CONTRACTOR shall be considered incidental to the construction of the project.

10. TESTING & SAMPLING

The CONTRACTOR shall furnish all samples of materials necessary for tests as determined by the ENGINEER or the Construction Observer. All samples taken for analysis and tests shall be taken in such a manner as to be truly representative of the entire lot under test. The CONTRACTOR shall furnish such assistance and facilities as the ENGINEER may require for collecting, storing or curing samples. Where materials tests are to be performed by the manufacturer, the certificates of approval shall be submitted to the ENGINEER. The cost of all such testing by manufacturers shall be incidental to the project. Additional required tests on materials in place shall be made at the expense of the OWNER, unless otherwise stipulated.

The OWNER's Agent shall arrange for and furnish testing services as provided by an acceptable independent laboratory as part of this Contract as noted in the General Conditions.

11. LIMITED WORK SPACE AND STOCKPILING MATERIALS

The CONTRACTOR shall receive no additional payment or contract extension for hardship or loss of productivity as a result of the limited work space vertically or horizontally. All stockpile locations must be approved by the ENGINEER prior to placement of materials, but the ENGINEER may request relocation of stockpiled or stored materials if they appear to create a plausible public safety hazard or any type of long-standing problem. Prior to use, the CONTRACTOR shall videotape the storage area and cost shall be incidental to the project. If the CONTRACTOR wishes to stockpile material on nearby vacant property, it will be his responsibility to contract the property owner for permission. The City will not become involved with any such agreements and will not be held responsible for any damages which the CONTRACTOR may cause to private property. The CONTRACTOR shall not be compensated for restoration of stockpiling areas unless said areas were within the original project grading limits. All surplus materials which cannot be incorporated into the work shall become the property of the CONTRACTOR and shall be removed from the project areas by the CONTRACTOR prior to final payment.

12. TRAFFIC MAINTENANCE & CONTROL

A. General

During the course of construction, provisions must be made to maintain access for emergency vehicles at all times. Where possible and when directed by the ENGINEER, all streets must be left open to traffic at the end of each working day. Traffic maintenance and control as defined in this section shall be considered as included in the unit bid prices or lump sum bid prices that are given in the Bid Form.

All work for maintaining traffic and control shall be in accordance with Section 812 of the 2012 MDOT Standard Specifications for Construction and the current edition of the Michigan Manual of Uniform Traffic Control Devices, (MMUTCD).

The CONTRACTOR shall conduct his operations and use of equipment in such a manner that traffic will be maintained throughout the entire length of each project area except when full road closures are required. When conditions are such as to warrant variations from this requirement, the procedure to be followed shall be approved by the ENGINEER prior to such procedure being put into effect.

The CONTRACTOR shall furnish, erect and maintain all barricades, signs and lights as required according to the current edition of the MMUTCD. Flagmen shall also be provided by the CONTRACTOR as necessary to protect the vehicular and pedestrian traffic and the work within the areas. CONTRACTOR shall be responsible for notifying concerned parties such as Police, Fire, and school officials if a road closure and/or detour will be in effect. The CONTRACTOR shall notify the same parties when the road has been reopened.

Once pavement work has begun, the CONTRACTOR must continue his work to completion. The OWNER will not permit random movements of work operations among the project areas that tend to confuse traffic patterns.

B. Provision for Local Traffic

During the progress of the work, the CONTRACTOR shall accommodate both local vehicular and pedestrian traffic along the roads.

Access to all residences and businesses shall be maintained except as noted on the plans or as directed by the ENGINEER.

The CONTRACTOR's truck and equipment operations on public streets shall be governed by all local traffic ordinances and regulations of the Fire and Police Departments, the OWNER, the Road Commission of Oakland County and Michigan Department of Transportation.

C. Existing Warning and Regulatory Signs

Wherever possible, all existing signs on this project are to be preserved and maintained as incidental to the project.

Where it is not possible to preserve existing traffic control signs and street name signs, they shall be removed, temporarily reset and maintained by the CONTRACTOR. Upon completion of the project, the CONTRACTOR will reset traffic control signs and street name signs in the proper position.

In cases where new signs are called for, they shall be placed in accordance with the requirements outlined elsewhere in the Contract Documents.

Any new or existing signs damaged by the CONTRACTOR shall be replaced in kind by him at no additional cost to the OWNER.

D. Lane Closures and Detours

During all hours of work one side of the boulevard must be maintained for use. Any lane closures or detours shall be approved by the OWNER and the appropriate governing agency, and shall meet their specifications and standards, as well as those of the MMUTCD. Where there are conflicts, the more restrictive requirement shall apply. If any type of closure is to occur during twilight or darkness, proper lighting will be required.

E. Construction Signs and Barricades

Warning signs and barricade configurations shall meet the requirements of the MMUTCD, the OWNER, Road Commission of Oakland County, and the Michigan Department of Transportation.

The CONTRACTOR shall not begin any operation on the project until all required signs and barricades have been set.

All signs to be used during twilight or darkness shall be reflectorized, in good condition, with two continuous flashing lights.

The construction site shall at all times be maintained and left in a clean, neat, and safe condition, including any construction signing.

After working hours, signs that are not appropriate shall be covered and/or removed so that motorists will not be confused. The CONTRACTOR shall also remove and replace or cover (where practical) existing traffic signs that may conflict with the proposed construction.

13. LOAD RESTRICTIONS ON LOCAL STREETS

The CONTRACTOR shall not operate heavy trucks or equipment on any side street within the project area without permission from ENGINEER, the OWNER or appropriate governing agency.

14. UTILITIES

The location of public or private shall be verified by the Contractor.

For protection of underground utilities, the CONTRACTOR shall contact "Miss Dig" at 1-800-482-7171 a minimum of three (3) working days prior to excavating. This does not relieve the CONTRACTOR of the responsibility of notifying utility owners who may not be part of the "Miss Dig" alert system.

During the course of the construction, the CONTRACTOR will encounter both overhead and underground utilities. The names and phone numbers of the utility company representatives are shown as follows:

UTILITY	OWNER	NAME & PHONE NUMBER
Electric	DTE Energy	Duane Will (313) 235-5632
Telephone	AT&T	Jeff Heath (248) 323-0498
Gas	Consumers Energy	Mike Jablonski (248) 858-4405
Cable Television	Comcast	Tim Dickinson (248) 549-8288
Water & Sanitary Sewer	City of Auburn Hills	Jason Deman (248) 391-3777

Utility relocation work is not expected to be necessary for this project.

In the event that utilities are encountered which require relocation, it shall be the CONTRACTOR's responsibility to arrange for and schedule the relocation of the affected utilities with the owners.

No additional compensation will be paid for delays due to the encountering of existing utilities that are or are not shown on the plans.

Work stoppages by employees of utility companies or any occurrence which results in a delay in utility relocations on this project may be considered as a basis for a claim for an extension of the time of completion, but will not be considered as a basis for a claim for extra compensation or an adjustment in Contract Unit Prices. The amount of any such time extension will be based upon the amount of delay actually experienced as a result of the utility relocation delay.

15. EMERGENCY REPAIR

When the CONTRACTOR is not actively performing work on a particular construction site, situations of an emergency nature may arise as a result of uncompleted work. Such situations may affect, directly or indirectly, public and/or private property, and may ultimately affect the health, safety, and welfare of individuals or the general public. The intent of this article is to provide a procedure to eliminate these problems as they occur.

While these problem situations can and do readily develop as emergencies, the ENGINEER shall direct field-related operations and require immediate efforts by the CONTRACTOR to remedy the deficiency in a method of his choosing because of his expertise in the field, time being of the essence. The correction of the “emergency” which may arise when no activity exists on the construction site shall be handled in the following manner:

The ENGINEER shall inspect the site, take any necessary photographs and/or prepare any necessary sketches of conditions at the site to determine that the situation constitutes an emergency.

The ENGINEER then has three alternative sources of manpower and equipment to be selected to remedy the emergency situation in the following order:

1. The CONTRACTOR under Contract with the OWNER to perform all work on the site location in question;
2. The OWNER’s Department of Public Works.
3. An independent CONTRACTOR designated by the OWNER.

Since the nature and extent of most unfinished work on a particular construction site is well known by both the ENGINEER’s authorized agent and the CONTRACTOR at the time of declaring such an “emergency situation” as set forth herein before; the CONTRACTOR under Contract to the OWNER for the particular project would be the first party notified and would be expected to respond immediately with necessary manpower and equipment to remedy the problem.

If a reasonable time to respond to the emergency notification is not evident, in the best judgment of the ENGINEER, then the CONTRACTOR shall be judged to have waived his rights to physically correct the problem, but not his obligations to pay for such a physical correction or damages resulting there from. The ENGINEER shall then contact the OWNER’s Department of Public Works for their assistance in correcting the “emergency situation”. Where existing commitments by the Department of Public Works prohibit their immediate response to the request by the ENGINEER, the ENGINEER shall finally direct that corrective measures be performed by the independent contractor previously contacted by the OWNER to perform such emergency work when so directed.

Since the cost for all remedial work undertaken by the CONTRACTOR on this project shall be borne by the CONTRACTOR and it is necessary to engage the services of the Department of Public Works or an independent contractor, then all costs incurred would be deducted from monies due and payable to the CONTRACTOR on the particular project as set forth on any ensuing regular job estimates.

Typical costs which will be deducted from Contract monies due would be:

- A. Payroll wages
- B. Material bills

- C. Equipment rental (Detroit area rates) and moving costs
- D. 15% profit and overhead for independent contractor
- E. 10% administrative costs
- F. Construction Observation costs

16. USE OF WATER

CONTRACTOR shall not make a connection to any fire hydrant without first obtaining the necessary permit (meter) from the City of Auburn Hills. The CONTRACTOR shall be charged for all water used. Contact Jason Deman for more information at (248) 391-3777.

17. IRRIGATION REPAIR

Description: This work shall consist of guidelines to repairing irrigation in the area of work.

Construction Methods: Existing lawn irrigation heads shall be relocated to accommodate the proposed construction. Additional irrigation heads not shown on the plans may be encountered in the line of the work. The Contractor shall exercise care in preserving and protecting existing lawn irrigation systems.

For the Contractor to be reimbursed for such repairs, before any contract work begins, Contractor shall arrange a walk-through with the property owner or designated representative, accompanied by the Engineer or inspector, of each and every adjacent property, for the purpose of determining and evaluating the existing irrigation system design (location and types of lines, heads, valves, controllers). The existing irrigation system shall also be operated to determine its functionality and integrity. This information will be documented with sketches, drawings, and narrative, by the Contractor, to be submitted to and used by the Engineer to verify need and approve any payment for repairs to the system. Any damaged or defective heads shall be replaced with new heads, paid for as **Sprinkler Head, Replace**. Upon completion of the repair, the irrigation system shall be tested and operated to demonstrate its functionality and integrity are consistent with pre-construction condition. No payment shall be made for repairs not deemed necessary and approved by the Engineer as a result of this walk-through and evaluation process. **Failure of the Contractor to fulfill these requirements shall cause the Engineer to make the repairs and charge the full cost to the Contractor as a contract adjustment.**

18. CONSTRUCTION STANDARDS

Chip & Fog Seal:

Per 2012 MDOT Standard Specifications for Construction, Division 505

HMA:

Per 2012 MDOT Standard Specification for Construction, Division 501.

Curb and Gutter Repair:

Per 2012 MDOT Standard Specification for Construction, Section 802.

Storm Structure Pointing, Rebuilding, Reset:

Per 2012 MDOT Standard Specification for Construction, Section 403 and 404.

City of Auburn Hills Storm Sewer Standard Details

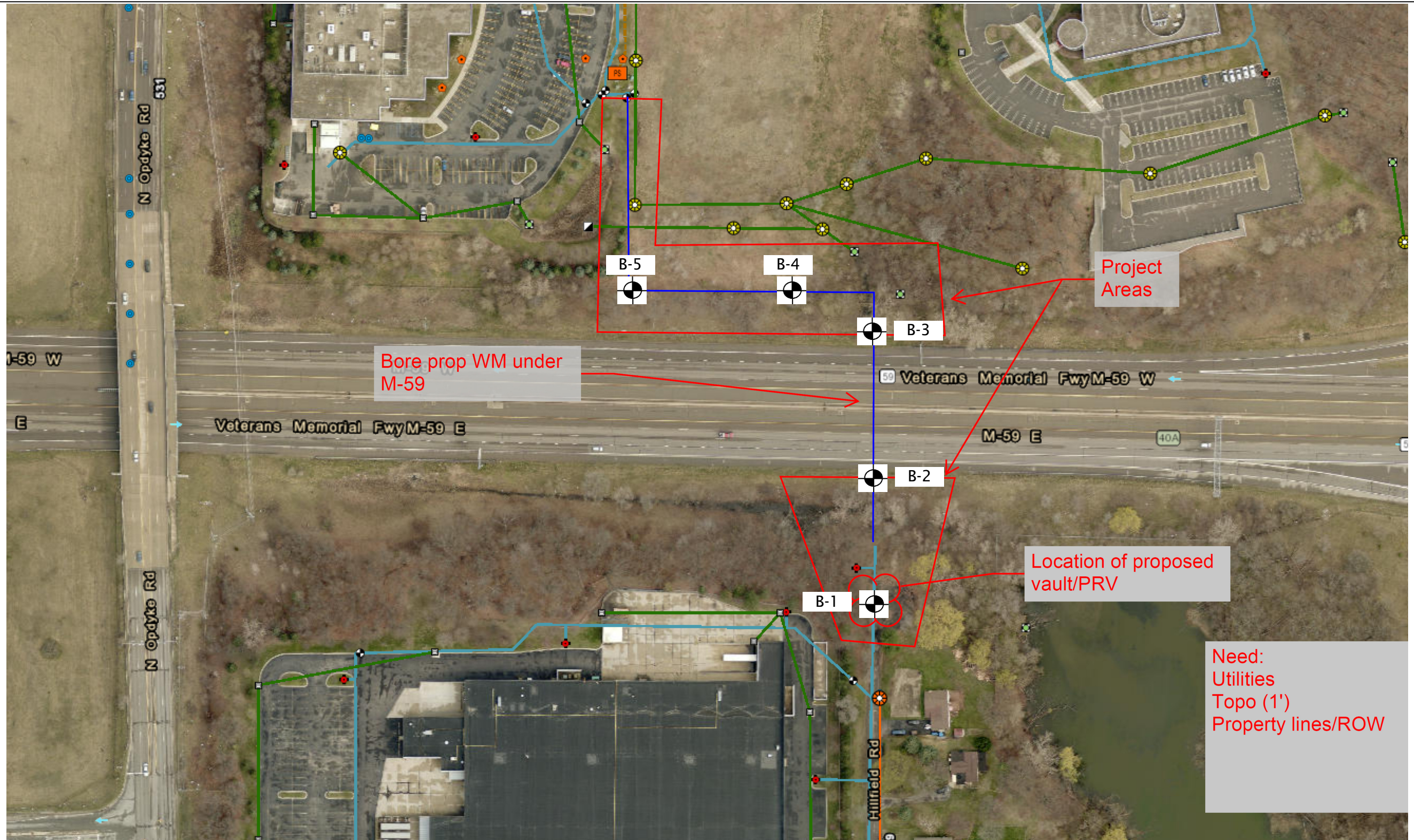
Sanitary Sewer Structure Pointing and Rebuilding:

City of Auburn Hills Sanitary Sewer Standard Details


Permanent Pavement Markings:


Per 2012 MDOT Standard Specification for Construction, Division 811.

Appendix A
M-59 & Hillfield Soil Borings



Legend


 Soil Borings performed by Strata Drilling, Inc. on March 22, 2021

Soil Boring Location Plan			
Hillfield/M-59 Water Main and PRV Project			
M-59, east of Opdyke Road			
Auburn Hills, Michigan			
	Project No. 210079		
	Drawn by: JMH		
	Date: 4/30/21	Plate No. 1	
	Scale: NTS		

Project Name: Proposed Hillfield/M-59 Water Main and PRV Project

Project Location: M-59, East of Opdyke Road
Auburn Hills, Michigan

G2 Project No. 210079

Latitude: N/A Longitude: N/A



Soil Boring No. B-1

CONSULTING GROUP

SUBSURFACE PROFILE

SOIL SAMPLE DATA

ELEV. (ft)	PRO- FILE	GROUND SURFACE ELEVATION: 885.0 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Fill: Black Clayey Sand with asphalt millings	1.5		4				
		Fill: Loose Brown Silty Sand with trace gravel		S-1	4	10			
880.0		Fill: Hard Dark Brown and Gray Silty Clay with trace sand, gravel, and organic matter (Organic Matter Content = 3.8%)	4.5	S-2	10	23	9.9		9000*
		Fill: Loose to Medium Compact Dark Brown Silty Sand with trace gravel, wood debris, and concrete debris	6.0	S-3	12				
875.0				S-4	8	13			
			10	S-5	5	9			
			12.0						
870.0		Loose Brown Silty Sand with trace gravel			2				
			15.0	S-5	3	7			
					4				
		End of Boring @ 15 ft							
865.0			20						
860.0			25						
855.0			30						
850.0			35						

Total Depth: 15 ft
Drilling Date: March 22, 2021
Inspector: N. Zaporski, EIT
Contractor: Strata Drilling, Inc.
Driller: D. Watkins

Water Level Observation:
Groundwater seepage at 4 feet during; dry upon completion

Notes:
* Calibrated Hand Penetrometer

Drilling Method:
2-1/4 inch inside diameter hollow stem augers

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 1

Project Name: Proposed Hillfield/M-59 Water Main and PRV Project

Project Location: M-59, East of Opdyke Road
Auburn Hills, Michigan

G2 Project No. 210079

Latitude: N/A Longitude: N/A



Soil Boring No. B-2

CONSULTING GROUP

SUBSURFACE PROFILE

SOIL SAMPLE DATA

ELEV. (ft)	PRO- FILE	GROUND SURFACE ELEVATION: 890.0 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Fill: Medium Compact Brown Sand with trace silt and gravel, occasional clay layers	3.0	S-1	4 6 8	14			
885.0			5	S-2	3 4 5	9			
		Fill: Loose Brown Silty Sand with trace clay and gravel, occasional clay layers		S-3	4 4 6	10			
880.0			10	S-4	6 4 6	10			
			10.5						
		Fill: Medium Compact Brown and Gray Silty Sand with trace clay, gravel, and organic matter (Organic Matter Content = 1.2% - 2.0%)		S-5	7 10 12	22			
875.0			15	S-6	8 9 10	19			
			18.0	S-7	4 6 6	12			
870.0			20	S-8	5 6 8	14			
				S-9	9 9 7	16			
865.0		Medium Compact Gray Sand with trace silt and gravel, occasional clay layers	25	S-10	4 6 6	12			
				S-11	4 6 6	12			
860.0			30.0	S-12	5 5 7	12			
		End of Boring @ 30 ft	30						
855.0			35						

Total Depth: 30 ft
Drilling Date: March 22, 2021
Inspector: N. Zaporski, EIT
Contractor: Strata Drilling, Inc.
Driller: D. Watkins

Water Level Observation:
26 feet during and upon completion of drilling

Excavation Backfilling Procedure:
Cement Grout

Drilling Method:
2-1/4 inch inside diameter hollow stem augers

Figure No. 2

Project Name: Proposed Hillfield/M-59 Water Main and PRV Project

Project Location: M-59, East of Opdyke Road
Auburn Hills, Michigan

G2 Project No. 210079

Latitude: N/A Longitude: N/A



Soil Boring No. B-3

CONSULTING GROUP

SUBSURFACE PROFILE

SOIL SAMPLE DATA

ELEV. (ft)	PRO- FILE	GROUND SURFACE ELEVATION: 890.0 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Fill: Dark Brown Sand and Gravel with asphalt millings	1.5		5				
				S-1	6	12			
885.0			5	S-2	6	12			
		Fill: Medium Compact Brown Sand with trace silt and gravel, occasional silt and clay layers		S-3	7	14			
880.0			10	S-4	5	10			
				S-5	5	9			
875.0		Fill: Loose Gray Sand with trace silt and gravel, occasional dark streaking	13.5		3				
			15	S-6	4	7			
		Fill: Medium Brown and Gray Sandy Clay with trace silt, gravel, and organic matter, occasional wet sand seams (Organic Matter Content = 6.3%)	15.5		3				
			18.0	S-7	3	6	19.6	107	1710
870.0		Very Stiff Brown and Gray Silty Clay with trace sand and gravel	20.0	S-8	7	13	13.0	126	6180
		Brown and Gray Clayey Sand with trace silt and gravel, occasional dark streaking	22.0		4				
				S-9	5	9	13.1		6000*
865.0		Very Stiff to Hard Brown and Gray Silty Clay with little sand and trace gravel, occasional sand layers	25.0	S-10	8	16	13.0		9000*
		Medium Compact Brown and Gray Clayey Sand with trace gravel		S-11	9	14			
860.0		Medium Compact Gray Clayey Sand with trace silt and gravel, occasional sand layers	28.5		4				
			30.0	S-12	6	11			
		End of Boring @ 30 ft							
855.0			35						

Total Depth: 30 ft
Drilling Date: March 22, 2021
Inspector: N. Zaporski, EIT
Contractor: Strata Drilling, Inc.
Driller: D. Watkins

Water Level Observation:
29 feet during, 25-1/2 feet upon completion

Notes:
Borehole collapsed at 26 ft after auger removal
* Calibrated Hand Penetrometer

Drilling Method:
2-1/4 inch inside diameter hollow stem augers

Excavation Backfilling Procedure:
Cement Grout

Figure No. 3

Project Name: Proposed Hillfield/M-59 Water Main and PRV Project

Project Location: M-59, East of Opdyke Road
Auburn Hills, Michigan

G2 Project No. 210079

Latitude: N/A Longitude: N/A



Soil Boring No. B-4

CONSULTING GROUP

SUBSURFACE PROFILE

SOIL SAMPLE DATA

ELEV. (ft)	PRO- FILE	GROUND SURFACE ELEVATION: 887.0 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Black Silty Sand (10 inches)	0.8						
		Fill: Loose Brown and Dark Brown Silty Sand with trace gravel and organic matter (Organic Matter Content = 1.8%)	3.0	S-1	3 3 3	6			
		Loose Brown Silty Sand with trace gravel	3.5						
882.0		Very Stiff to Hard Brown Silty Clay with trace sand and gravel	5	S-2	2 5 6	11	16.1		4000*
				S-3	6 7 9	16	14.3		9000*
		Loose Brown Silty Sand with trace gravel	8.0						
877.0			9.0	S-4	2 3 5	8	13.1		4500*
		Very Stiff Brown and Gray Sandy Clay with trace silt and gravel, occasional sand seams							
872.0			15.0	S-5	4 5 5	10	12.3		5000*
		End of Boring @ 15 ft							
867.0			20						
862.0			25						
857.0			30						
852.0			35						

Total Depth: 15 ft
Drilling Date: March 22, 2021
Inspector: N. Zaporski, EIT
Contractor: Strata Drilling, Inc.
Driller: D. Watkins

Water Level Observation:
Dry during and upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Drilling Method:
2-1/4 inch inside diameter hollow stem augers

Figure No. 4

Project Name: Proposed Hillfield/M-59 Water Main and PRV Project

Project Location: M-59, East of Opdyke Road
Auburn Hills, Michigan

G2 Project No. 210079

Latitude: N/A Longitude: N/A



Soil Boring No. B-5

CONSULTING GROUP

SUBSURFACE PROFILE

SOIL SAMPLE DATA

ELEV. (ft)	PRO- FILE	GROUND SURFACE ELEVATION: 897.0 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Black Sandy Clay (6 inches)	0.5						
		Fill: Stiff to Very Stiff Brown Sandy Clay with trace silt, gravel, and roots		S-1	3 4 4	8	17.9		5000*
892.0			5	S-2	3 3 3	6	14.3		2000*
		Loose Brown Clayey Sand with trace gravel, occasional roots	5.5	S-3	3 4 6	10			
887.0			10	S-4	7 8 10	18			
		Medium Compact Brown Clayey Sand with trace gravel							
882.0			15	S-5	7 13 17	30			
		End of Boring @ 15 ft							
877.0			20						
872.0			25						
867.0			30						
862.0			35						

Total Depth: 15 ft
Drilling Date: March 22, 2021
Inspector: N. Zaporski, EIT
Contractor: Strata Drilling, Inc.
Driller: D. Watkins

Water Level Observation:
Dry during and upon completion

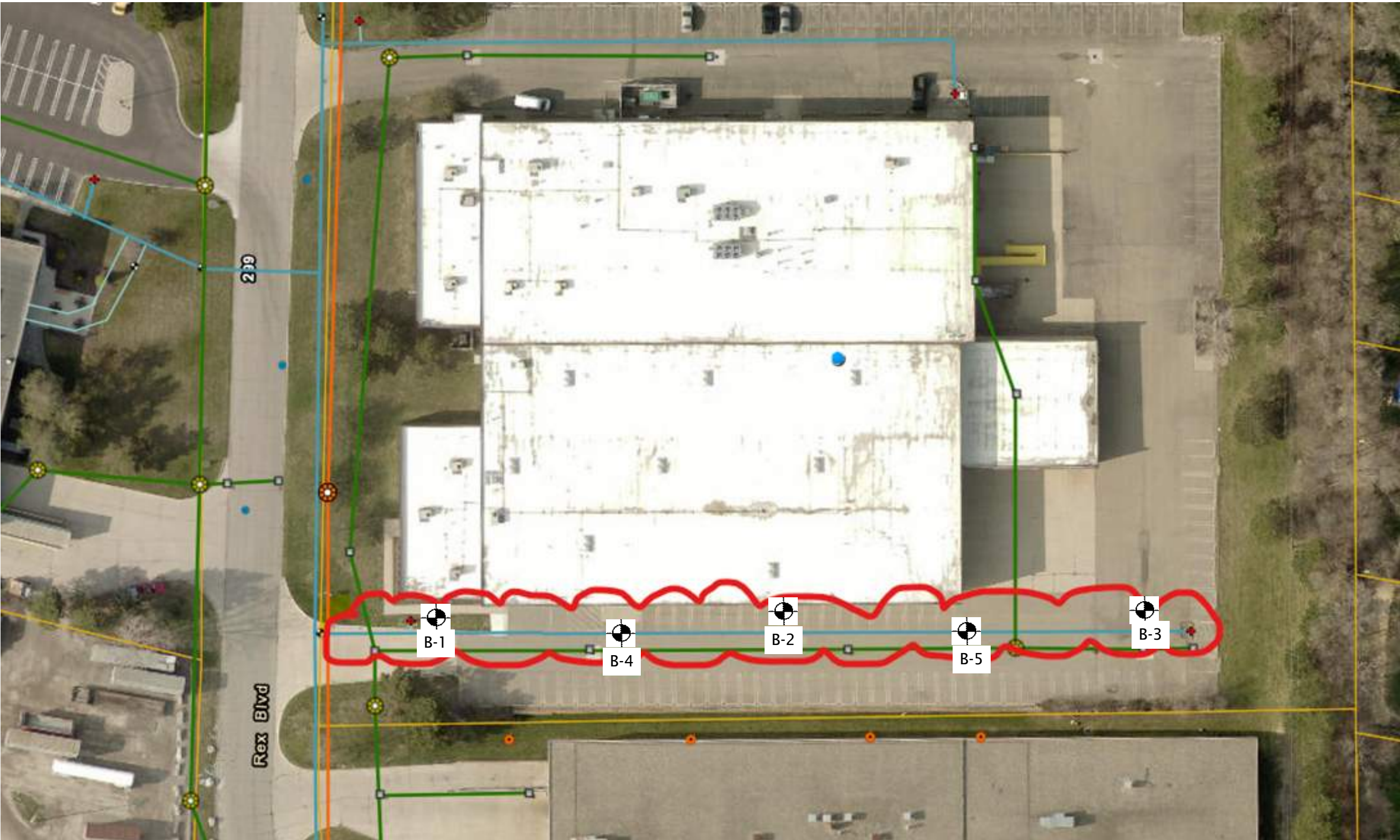
Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings


Drilling Method:
2-1/4 inch inside diameter hollow stem augers


Figure No. 5

Appendix B
Rex Blvd Soil Borings



Legend

 Soil Borings performed by Strata Drilling, Inc. on March 22, 2021

Soil Boring Location Plan			
Proposed Water Main Replacement Project 260 Rex Boulevard Auburn Hills, Michigan			
	Project No. 210116		
	Drawn by: JMH		
	Date: 4/28/21	Plate No. 1	
	Scale: NTS		

Project Name: Proposed Water Main Replacement Project

Project Location: 260 Rex Boulevard
Auburn Hills, Michigan

G2 Project No. 210116

Latitude: N/A Longitude: N/A



Soil Boring No. B-1

CONSULTING GROUP

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 (4 inches)	0.3						
		Aggregate Base (8 inches)	1.0						
5		Fill: Very Loose to Loose Brown and Gray Clayey Sand with trace gravel and organic matter, occasional clay clods and layers (pH = 6.39 @ 7-1/2 feet)	5	S-1	3 4 4	8			
			5	S-2	5 3 5	8			
				S-3	WOH WOH WOH	---			
10			10.0	S-4	WOH 2 2	4			
		End of Boring @ 10 ft							
15			15						

Total Depth: 10 ft
 Drilling Date: March 22, 2021
 Inspector:
 Contractor: Strata Drilling, Inc.
 Driller: B. Sienkiewicz

Water Level Observation:
 9 feet during drilling, dry upon completion

Excavation Backfilling Procedure:
 Auger cuttings, capped with cold patch

Drilling Method:
 4" diameter solid stem augers

Figure No. 1

SOIL / PAVEMENT BORING 210116 G2 CONSULTING DATA TEMPLATE.GDT 4/12/21

Project Name: Proposed Water Main Replacement Project

Project Location: 260 Rex Boulevard
Auburn Hills, Michigan

G2 Project No. 210116

Latitude: N/A Longitude: N/A



Soil Boring No. B-2

CONSULTING GROUP

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						
		Bituminous Millings (8 inches)	0.9						
		Fill: Brown Sand and Gravel (10 inches)	1.5						
		Fill: Very Stiff Brown and Gray Sandy Clay with trace silt and gravel	3.0	S-1	3 6 4	10	13.3		8000*
5		Fill: Loose Brown and Gray Clayey Sand (pH = 7.06 @ 5 feet)	5	S-2	3 4 4	8	9.3		4000*
		Fill: Stiff Gray Clayey Sand with trace gravel	6.0	S-3	3 3 3	6	14.7		3500*
10		Very Loose Gray Clayey Sand with trace silt and gravel, occasional wet silt layers	10.0	AS-1	WOH WOH WOH	---			
15		End of Boring @ 10 ft	15						

Total Depth: 10 ft
Drilling Date: March 22, 2021
Inspector:
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Water Level Observation:
9 feet during drilling, dry upon completion

Notes:
* Calibrated Hand Penetrometer

Drilling Method:
4" diameter solid stem augers

Excavation Backfilling Procedure:
Auger cuttings, capped with cold patch

Figure No. 2

Project Name: Proposed Water Main Replacement Project

Project Location: 260 Rex Boulevard
Auburn Hills, Michigan

G2 Project No. 210116

Latitude: N/A Longitude: N/A



Soil Boring No. B-3

CONSULTING GROUP

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 (4 inches)	0.3						
		Bituminous Millings (4 inches)	0.7						
		Aggregate Base (6 inches)	1.2						
5		Very Stiff Brown Sandy Clay with trace silt and gravel (pH = 7.35 @ 7-1/2 feet)	5	S-1	7 5 5	10	10.3		6500*
		Very Stiff Gray Silty Clay with trace sand and gravel	8.0	S-2	6 7 8	15	10.2		8000*
10		End of Boring @ 10 ft	10.0	S-3	7 7 7	14	11.5		5000*
				S-4	3 5 5	10	13.8		4000*
15			15						

Total Depth: 10 ft
Drilling Date: March 22, 2021
Inspector:
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Water Level Observation:
Dry during and upon completion of drilling

Notes:
* Calibrated Hand Penetrometer

Drilling Method:
4" diameter solid stem augers

Excavation Backfilling Procedure:
Auger cuttings, capped with cold patch

Figure No. 3

Project Name: Proposed Water Main Replacement Project

Project Location: 260 Rex Boulevard
Auburn Hills, Michigan

G2 Project No. 210116

Latitude: N/A Longitude: N/A



Soil Boring No. **B-4**

CONSULTING GROUP

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 (6 inches)	0.5						
		Fill: Loose Brown Sand with trace silt and gravel (pH = 7.29 @ 2-1/2 feet)		S-1	3 3 3	6			
		End of Boring @ 3 ft	3.0						
5			5						
10			10						
15			15						

Total Depth: 3 ft
Drilling Date: March 22, 2021
Inspector:
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Water Level Observation:
Dry during and upon completion of drilling

Excavation Backfilling Procedure:
Auger cuttings, capped with cold patch

Drilling Method:
4" diameter solid stem augers

Project Name: Proposed Water Main Replacement Project

Project Location: 260 Rex Boulevard
Auburn Hills, Michigan

G2 Project No. 210116

Latitude: N/A Longitude: N/A



Soil Boring No. B-5

CONSULTING GROUP

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						
		Bituminous Millings (6 inches)	0.8						
		Aggregate Base (6 inches)	1.3						
		Fill: Dark Brown Silty Clay with trace sand, gravel, and organic matter (pH = 6.95 @ 2-1/2 feet)		S-1	2 3 4	7			
			3.0						
		End of Boring @ 3 ft							
5			5						
10			10						
15			15						

Total Depth: 3 ft
Drilling Date: March 22, 2021
Inspector:
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Excavation Backfilling Procedure:
Auger cuttings, capped with cold patch

Drilling Method:
4" diameter solid stem augers