

GATE VALVE REPLACEMENT 2025

MERIDIAN TOWNSHIP

DEPARTMENT OF PUBLIC WORKS

INGHAM COUNTY, MICHIGAN

GATE VALVE REPLACEMENT 2025

FOR
CHARTER TOWNSHIP OF MERIDIAN

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CHARTER TOWNSHIP OF MERIDIAN

GATE VALVE REPLACEMENT 2025

ADVERTISEMENT FOR BIDS

Sealed proposals will be received by the Charter Township of Meridian, Ingham County, Michigan, at the Meridian Township Clerk's Office, Municipal Building, 5151 Marsh Road, Okemos, Michigan, 48864-1198, Ph. 517.853.4000, up to 11:00 am, local time on Thursday, June 5, 2025 for the installation of three (3) new 16-inch gate valves, one (1) new 20-inch gate valve, and repair of one (1) 8-inch gate valve mostly along Grand River Avenue in Meridian Township.

Bids are solicited on a unit price basis. The work involves the following major bid items:

- Isolation of sixteen (16) inch D.I. water main at three (3) locations
- Isolation of twenty (20) inch D.I. water main at one (1) location
- Installation of three (3) 16-inch gate valves
- Installation of one (1) 20-inch gate valve
- Repair of one (1) 8-inch gate valve

Proposals shall include the furnishing of all labor, material, and some equipment to complete the project. Equipment to be furnished by Meridian Township includes:

- Three (3) 16" Gate Valves, Valve Boxes, and MEGALUG Fittings
- One (1) 20" Gate Valve, Valve Box, and MEGALUG Fittings

Work on the project may commence any time after the "Notice To Proceed" is issued. Construction shall be completed by November 1st, 2025. Completion is defined as being constructed, tested, placed in service, and the site restored.

Each proposal shall be accompanied by a certified check or a bid bond by a recognized surety company similar to a U.S. Government Standard form bid bond, in the amount of five percent (5%) of the bid, payable to the Charter Township of Meridian, Ingham County, Michigan as security for the acceptance of the Contract.

Insurance and bonds are required from the successful bidder for this project; please see pages G-2 thru G-3 for those requirements. *Please note Owner/Contractors Protective Liability is required for all our contracts.*

The vendor's agreement to pay prevailing wage rates is one relevant consideration that Meridian Township may make in its determination of which bidder should receive this contract. Meridian Township may thus consider in awarding this contract whether any vendor voluntarily pays employees and sub-contractors, directly upon the site of work, at least the prevailing wages and fringe benefits as determined and published by the United States Department of Labor for the Ingham County area.

The contract documents may be examined at the following locations:

- Meridian Charter Township, Dept of Public Works, 5151 Marsh Road, Okemos, MI 48864
- Builders Exchange of Lansing & Central MI, 1240 E. Saginaw St., Lansing, MI 48906-5522
- Builders Exchange of Michigan, 678 Front Ave. NW, Ste. 330, Grand Rapids, MI 49504
- Construction Assoc of MI, 43636 Woodward, Bloomfield Hills, MI 48302
- Dodge Data & Analytics, 2521 E. Michigan Avenue, Lansing, MI 48912-4010

PDF copies of the plans and contract documents can be downloaded from the Township website here: <https://www.meridian.mi.us/government/township-projects>. To be added to the Township's list of prospective bidders, please make sure to contact the Engineering Office, as described below.

Hard copies of the contract documents for the work may be obtained from the Department of Public Works & Engineering at 5151 Marsh Road, Okemos, Michigan, for a non-refundable fee of ten dollars (\$10). There is a five dollar (\$5.00) fee for mailing contract documents. Contract documents may be obtained via email free of charge. Questions regarding this contract may be addressed to Meridian Township Department of Public Works & Engineering by phone at 517.853.4440, or by email at DPW@meridian.mi.us.

In submitting this bid, it is understood that the right is reserved by the Owner to reject any or all bids, to award the Gate Valve Replacement 2025

Contract to other than the low bidder, to award separate contracts for each project and/or phase, 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.

INSTRUCTIONS TO BIDDERS

1. PROPOSALS

Proposals must be made upon the forms provided, without modifications or changes and all other data submitted as required.

The proposal must be enclosed in a sealed envelope marked "Bid Proposal – Meridian Township Gate Valve Replacement Contract 2025" clearly indicating the name and address of the bidder, and filed at the place and by the time specified in the Advertisement.

2. BASIS OF PROPOSALS

Proposals are solicited on the basis of unit prices for the entire work of the contract. Proposals may be submitted for any one or all of the projects or phases, as may be applicable.

The right is reserved by the Owner to reject any and all bids, to award the Contract to other than the low bidder, to award separate Contracts for each project and/or phase, 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.

3. BID DEPOSITS

Each proposal shall be accompanied by a certified check, or bid bond from a recognized surety company, in the amount of five percent (5%) of the total amount of the bid, payable to the order of the Owner, to be forfeited to the Owner in case of failure on the part of the successful bidder to enter into the attached form of Contract to do the work covered by such Proposal at the price and within the time stated therein. The bid deposit of all except the successful bidder will be returned within four weeks after opening of bids. The bid deposit of the successful bidder will be returned within 48 hours after the executed Contract has been finally approved by the Owner.

4. QUALIFICATION OF BIDDERS

It is the intention of the Owner to award the Contract(s) to contractor(s) fully capable, both financially and as regards experience to perform and complete all work in a satisfactory manner. Evidence of such competency must be furnished, including a listing of similar projects which the bidder has satisfactorily undertaken and completed.

5. INTERPRETATION OF DOCUMENTS

If the bidder is in doubt as to the true meaning of any part of the plans, specifications or Contract Documents, he may submit to the Engineer a written request for an interpretation thereof. Any interpretation made in response to such query will be mailed or duly delivered to each prospective bidder. The Owner will not be responsible for any other explanation or interpretation of the Contract Documents.

6. REQUIREMENT OF SIGNING BIDS

Bids which are not signed by the individual making them shall have attached thereto a power of attorney evidencing authority to sign the bid in the name of the person for whom it is signed.

Bids, which are signed by a partnership, shall be signed by all of the partners or by an attorney-in-fact. If signed by an attorney-in-fact, there shall be attached to the bid a power of attorney evidencing authority to sign the bid, executed by the partners.

Bids which are signed for a corporation shall have the correct corporate name thereof and the signature of the president or other authorized officers of the corporation manually written below the corporate name following the word "By". If such a bid is manually signed by an officer other than the president of the corporation, a certified copy of a resolution of the board of directors evidencing the

INSTRUCTIONS TO BIDDERS

authority of such official to sign the bid shall be attached to it. Such a bid shall also bear the attested signature of the secretary of the corporation and the corporate seal.

7. EXECUTION OF AGREEMENT

The bidder to whom an award is made will be required to enter into the written contract included herein, within ten (10) calendar days after being notified of the acceptance of his bid and receipt by him of the copies of the documents to be executed. In case of failure to comply with this requirement, he may be considered to have abandoned all his rights and interests in the award and his certified check or amount of bidder's bond may be declared to be forfeited to the Owner and the Contract may be awarded to another bidder.

8. INSURANCE (Ref. General Conditions – GC.2)

The contractor will be required to carry Worker's Compensation Insurance, Bodily Injury and Property Damage, Builder's Risk Insurance and Owner's Protective Liability in the amounts specified in the General Conditions. Certificates of such insurance must be attached to each copy of the executed Contract Documents.

9. BONDS (Ref. General Conditions – GC.1)

The successful bidder will be required to furnish for each set of executed Contract Documents and conformed copies thereof an original completed Performance Bond, and Labor and Material Bond with surety acceptable to the Owner as set forth in the General Conditions.

10. BIDDER'S RESPONSIBILITY FOR EXAMINING PLANS AND SITE

At the time of opening bids, each bidder will be presumed to have made a personal investigation of the site of the work and of existing structures, and to have read and be thoroughly familiar with the plans, specifications and Contract Documents (including all addenda). He shall determine to his own satisfaction the conditions to be encountered, the nature of the ground, difficulties involved in completing the Contract and all factors affecting the work proposed under this Contract.

The bidder to whom this contract is awarded will not be entitled to any additional compensation by reason of his failure to fully acquaint himself with the conditions at the site or by his failure to fully examine the plans, specifications and Contract Documents.

11. NON-DISCRIMINATION IN EMPLOYMENT

The Contractor shall adhere to all applicable Federal, State and local laws, ordinances, rules and regulations prohibiting discrimination with regards to employees and applicants for employment. The contractor and his/her subcontractors shall not discriminate against an employee or applicant for employment with respect to hire, tenure, terms, conditions or privileges of employment, including a benefit plan or system or a matter directly or indirectly related to employment, because of race, color, religion, national origin, sex, age, height, weight, condition of pregnancy, marital status, physical or mental limitation, disability, source of income, familial status, educational association, sexual orientation, gender identity or expression, or HIV status. Breach of this section shall be regarded as a material breach of this Contract.

PROPOSAL

TO: Charter Township of Meridian
5151 Marsh Road
Okemos, MI 48864

RE: GATE VALVE REPLACEMENT 2025

Board of Trustees:

The undersigned, as a bidder, hereby declares that these bids are made in good faith, without fraud or collusion with any person or persons bidding on the same Contract, that he has read and examined the Advertisement, Instruction to Bidders, Proposal, Contract, General Conditions, Specifications, Special Provisions and Plans and understands all of the same; that he or his representative has made personal investigation at the site and has informed himself fully with regard to the conditions to be met in the execution of the Contract.

In submitting this bid, it is understood that the right is reserved by the Owner to reject any or all bids, to award the Contract to other than the low bidder, to award separate contracts for each project and/or phase, 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.

It is further understood and agreed by the undersigned that any qualifying statement or conditions made to this proposal as originally published, as well as any interlineation, erasures, omissions or entered wording obscure as to its meaning, may cause the bid to be declared irregular and may be cause for rejection of the bid.

The undersigned agrees to start work within ten (10) days of issuance of the Notice to Proceed. The undersigned further agrees to complete all work covered by this Proposal to the point of use of the project by the Owner by the completion date stated in the Advertisement or within the number of calendar days stated in the Advertisement; and that for all days thereafter until final acceptance, there will be charged, as liquidated damages, the sum of \$1,000 per calendar day per project for each and every day thereafter until final acceptance.

The undersigned hereby proposes to perform everything required to be performed and to furnish all labor, materials, tools, equipment and all utility and transportation services necessary to complete in a workmanlike manner all the work to be done under this Contract, including addenda thereto, for the sums set forth in the following Bidding Schedule:

GATE VALVE REPLACEMENT 2025

PROPOSAL – Line Stops

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>QTY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>AMOUNT</u>
1a.	Traffic Control (Grand River Ave)	1	LS	\$_____	\$_____
1b.	Traffic Control (Park Lake Rd)	1	LS	\$_____	\$_____
9a.	Pavt, Rem, Concrete	200	SF	\$_____	\$_____
9b.	Pavt, Rem, Asphalt	500	SF	\$_____	\$_____
31a.	Water Main, 16 inch, Line Stop	6	EA	\$_____	\$_____
31b.	Water, Sleeve, 16 inch	3	EA	\$_____	\$_____
31c.	Water Main, 20 inch, Line Stop	2	EA	\$_____	\$_____
31d.	Water, Sleeve, 20 inch	1	EA	\$_____	\$_____
32a.	Water, Gate Valve, 16 inch (Installation)	3	EA	\$_____	\$_____
32b.	Water, Gate Valve, 20 inch (Installation)	1	EA	\$_____	\$_____
32c.	Water, Gate Valve, 8 inch (Exposure)	1	EA	\$_____	\$_____
32d.	Water, Gate Valve, 8 inch (Repair Allowance)	1	EA	\$3,000	\$3,000
40a.	Concrete, 4 inch	200	SF	\$_____	\$_____
40b.	Concrete, 7 inch	100	SF	\$_____	\$_____
42.	HMA, 13A	30	TN	\$_____	\$_____
45a.	Curb & Gutter, Rem	40	FT	\$_____	\$_____
45b.	Curb & Gutter, Inst	40	FT	\$_____	\$_____
53a.	Erosion Control, Silt Fence	200	FT	\$_____	\$_____
53b.	Erosion Control, Inlet Protection, Fabric Drop 5		EA	\$_____	\$_____
54.	Site Restoration	1	LS	\$_____	\$_____

TOTAL BID: \$_____

GATE VALVE REPLACEMENT 2025

PROPOSAL – Insertion Valve

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>QTY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>AMOUNT</u>
1a.	Traffic Control (Grand River Ave)	1	LS	\$_____	\$_____
1b.	Traffic Control (Park Lake Rd)	1	LS	\$_____	\$_____
9a.	Pavt, Rem, Concrete	200	SF	\$_____	\$_____
9b.	Pavt, Rem, Asphalt	500	SF	\$_____	\$_____
32c.	Water, Gate Valve, 8 inch (Exposure)	1	EA	\$_____	\$_____
32d.	Water, Gate Valve, 8 inch (Repair Allowance)	1	EA	\$3,000_____	\$3,000_____
32e.	Water, Insertion Valve, 16 inch (Installation)	3	EA	\$_____	\$_____
32f.	Water, Insertion Valve, 20 inch (Installation)	1	EA	\$_____	\$_____
40a.	Concrete, 4 inch	200	SF	\$_____	\$_____
40b.	Concrete, 7 inch	100	SF	\$_____	\$_____
42.	HMA, 13A	30	TN	\$_____	\$_____
45a.	Curb & Gutter, Rem	40	FT	\$_____	\$_____
45b.	Curb & Gutter, Inst	40	FT	\$_____	\$_____
53a.	Erosion Control, Silt Fence	200	FT	\$_____	\$_____
53b.	Erosion Control, Inlet Protection, Fabric Drop	5	EA	\$_____	\$_____
54.	Site Restoration	1	LS	\$_____	\$_____

TOTAL BID: \$_____

Give the name of the Owners and dates of other projects which the Bidder has constructed or has had responsible charge of construction:

NAME

DATE

The Bidder acknowledges that his bid is in accordance with the information contained in Addendum No. ____, ____, ____, ____.

The Bidder is hereby reminded that the Pay Items listed under the Bidding Schedule are the only items for which he will receive payment under this Contract. In the event that lesser or greater quantities of specific Pay Items are required to complete the work and place the system in operation, the total amount bid for the specific item will be adjusted by the unit price bid to the actual quantities utilized. In the event that an error is made in extending the unit prices, the Bidder is hereby notified that the unit prices as bid, will govern in determining the Total Base Bid. It is expressly understood and agreed that the Total Base Bid is the basis for establishing the amount of Bid Security on this Proposal and for comparison of bids only and is not to be constructed as a lump sum Proposal.

The undersigned attaches hereto a certified check or bidder's bond in the sum of not less than five percent (5%) of the Total Base Bid as required by the Advertisement and Instructions to Bidders and the undersigned agrees that in case he shall fail to fulfill his obligations under this Proposal and/or shall fail to furnish bonds, as specified, the Owner may, at its option determine that the certified check or amount of said certified check or bidder's bond accompanying this Proposal has been forfeited to the Owner, but otherwise the said certified check or bidder's bond shall be returned to the undersigned upon the execution of the Contract and acceptance of the bond.

The undersigned further agrees that this proposal shall be effective for a period of sixty (60) days from the date established for opening of all bids.

Date _____ Company Name _____

By _____ Address _____
Signature

Printed Name

Title _____ Phone Number _____

Email Address _____

The vendor's agreement to pay prevailing wage rates is one relevant consideration that Meridian Township may make in its determination of which bidder should receive this contract. Meridian Township may thus consider in awarding this contract whether any vendor voluntarily pays employees and sub-contractors, directly upon the site of work, at least the prevailing wages and fringe benefits as determined and published by the United States Department of Labor for the Ingham County area.

Will the bidder voluntarily pay its employees and sub-contractors, directly upon the site of work, at least the prevailing wages and fringe benefits as determined and published by the United States Department of Labor for the Ingham County area. Please circle one below:

Yes or No

GATE VALVE REPLACEMENT 2025

THIS CONTRACT, dated _____, 2025 by and between _____, hereinafter called the "CONTRACTOR", and Meridian Charter Township, 5151 Marsh Road, Okemos, MI 48864-1198, hereinafter called the "OWNER".

WITNESSETH, that the CONTRACTOR and the OWNER for the consideration herein agree as follows:

ARTICLE I. SCOPE OF WORK.

The CONTRACTOR shall perform everything required to be performed and shall provide and furnish all labor, materials, necessary tools, expendable equipment and all utility and transportation services required to perform and complete in a workmanlike manner all the work required for constructing the project as described in the Advertisement and Proposal and for performing all related work for the OWNER, required by and in strict accordance with the plans and specifications, including any and all addenda, and other Contract Documents mentioned and made a part hereof.

ARTICLE II. THE CONTRACT PRICE.

The OWNER shall pay for constructing the project complete with all labor, materials, equipment, appurtenances, surface restoration and related work in strict accord with the Plans and Specifications, ready for use, the unit prices as listed in the Proposal and herein made a part of this Contract. Payment shall be made to the CONTRACTOR in accordance with and subject to the conditions specified under General Conditions.

ARTICLE III. TIME.

Time is of the essence in the performance of this contract. The CONTRACTOR agrees to start work within ten (10) days of issuance of the Notice to Proceed and to fully complete the work so as to permit use of the project by the OWNER within the number of calendar days or by the completion date listed in the Advertisement.

ARTICLE IV. DELAYS AND DAMAGES.

If the CONTRACTOR refuses or fails to prosecute the work, or any separate part thereof, with such diligence as will insure its substantial completion, ready for operation within the number of consecutive calendar days specified herein, or any extension thereof, or fails to complete said work within such time, the OWNER may, by written notice to the CONTRACTOR, terminate the CONTRACTOR's right to proceed with the work or such part of the work as to which there has been delay. In such event, the OWNER may take over the work and prosecute the same to completion by contract or otherwise, and the CONTRACTOR and his sureties shall be liable to the OWNER for any excess cost occasioned thereby. If the CONTRACTOR's right to proceed is so terminated, the OWNER will take possession of and utilize in completing work such materials, appliances, and plant as may be on the site of the work and necessary therefore.

If the OWNER does not terminate the right of the CONTRACTOR to proceed, the CONTRACTOR shall continue to work, in which event the actual damages for the delay will be impossible to determine and in lieu thereof the CONTRACTOR shall pay the OWNER the sum of one thousand dollars (\$1,000.00) per day as fixed, agreed, and liquidated damages for each calendar day of delay until the work is substantially completed, ready for operation and the CONTRACTOR and his sureties shall be liable for the amount thereof. However, the right of the CONTRACTOR to proceed shall not be terminated or the CONTRACTOR charged with liquidated damages because of any delays in the completion of the work due to unforeseeable causes beyond control and without the fault or negligence of the CONTRACTOR, including, but not restricted to acts of God, or of the public enemy, acts of the OWNER, fires, floods, epidemics, quarantine restrictions, delays of subcontractors due to such causes, if the CONTRACTOR shall, within ten (10) days from the beginning of any such delay (unless the OWNER shall grant a further period of time prior to the date of final settlement of the Contract) notify the OWNER in writing of the cause of delay and extend the time for completing the work when, in OWNER's judgement, the finding of fact justify such an extension and OWNER's findings of fact thereon shall be final and conclusive on the parties thereto. In no event shall bankruptcy or labor disputes, or the like, either of CONTRACTOR or any of its subcontractors or suppliers, be considered as an unforeseeable cause beyond the control and without the fault or negligence of the CONTRACTOR.

ARTICLE V. COMPONENT PARTS OF THIS CONTRACT.

This Contract consists of the following component parts, all of which are as fully a part of the Contract as if herein set out verbatim, or, if not attached: 1) Advertisement, 2) Instructions to Bidders, 3) Proposal, 4) Addenda, 5) Contract, 6) Bonds and Insurance, 7) General Conditions, 8) General Specifications, 9) Ingham County Department of Transportation and Roads Specifications, 10) Standard Specifications, 11) Special Provisions, 12) Plans, and 13) Notice to Proceed.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed in three (3) original counterparts the day and year first above written.

CONTRACTOR

WITNESS:

By: _____

Title: _____

CHARTER TOWNSHIP OF MERIDIAN
OWNER

WITNESS:

By: _____
Dan Opsommer

Title: Deputy Township Manager
Director of Public Works & Engineering

Date: _____

NOTICE OF AWARD

Dated: _____

TO: _____

ADDRESS: _____

CONTRACT: GATE VALVE REPLACEMENT 2025

You are notified that your Bid dated _____, for the above Contract has been considered. You are the apparent Successful Bidder and have been awarded a Contract for GATE VALVE REPLACEMENT 2025.

The Contract Price of your Contract is: \$ _____.

Three copies of each of the proposed Contract Documents accompany this Notice of Award.

You must comply with the following conditions within 10 days of the date you receive this Notice of Award.

1. Deliver to the OWNER **three** fully executed counterparts of the Contract Documents. (Each of the Contract Documents must bear your signature on page C-3.)
2. Deliver with the executed Contract Documents the Contract security (Bonds and Insurance) as specified in General Conditions (GC).
3. If not listed as the owner, president, or partner, we need a letter (on letterhead) stating the person signing contract, has permission to sign the contract.

Failure to comply with these conditions within the time specified will entitle OWNER to consider your Bid in default, to annul this Notice to Award and to declare your Bid security forfeited.

Within ten days after you comply with the above conditions, OWNER will return to you one fully executed counterpart of the Contract Documents.

CHARTER TOWNSHIP OF MERIDIAN

By: _____
Dan Opsommer
Deputy Township Manager
Director of Engineering & Public Works

NOTICE TO PROCEED

Dated: _____

TO: _____

ADDRESS: _____

CONTRACT: **GATE VALVE REPLACEMENT 2025**

You are notified that the Contract Times under the above Contract will commence to run on _____ **2025**. By that date, you are to start performing your obligations under the Contract Documents. In accordance with Article III of the Contract, the date of Completion is: _____ **2025**.

Deliver to **OWNER** an acknowledged copy of this Notice to Proceed.

MERIDIAN TOWNSHIP

By: _____
Younes Ishraidi, P.E.
Township Engineer/Deputy Director PW

ACKNOWLEDGEMENT OF ACCEPTANCE OF NOTICE TO PROCEED

CONTRACTOR acknowledges acceptance of this Notice to Proceed this _____ day of _____, 2025.

By: _____
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GENERAL CONDITIONS

GENERAL CONDITIONS

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GENERAL CONDITIONS

GC.1 CONTRACT SECURITY

The Contractor shall furnish a surety bond, by a duly authorized surety company satisfactory to the Owner, in an amount equal to 100 percent (100%) of the Contract price as security for the faithful performance of this Contract. The Contractor shall also furnish a separate surety bond, by a duly authorized surety company satisfactory to the Owner, in an amount equal to 100 percent (100%) of the Contract price as security for the payment of all persons performing labor and/or furnishing materials.

The surety company writing the bid, performance, labor and material, and maintenance bond shall be: 1) acceptable to the Owner, 2) be listed in the Federal Register as published by the U.S. Department of Treasury under most recently revised Circular 570; 3) have an A.M. Best Company's Insurance reporting rating of no less than A- (Excellent); and 4) authorized to do business in the State of Michigan by the Michigan Department of Licensing & Regulatory Affairs Office of Financial and Insurance Regulations. Upon request, the Contractor shall submit evidence of such insurance.

GC.2 CONTRACTORS' AND SUBCONTRACTORS' INSURANCE

The Contractor shall not commence work under this Contract until he/she has obtained all the insurance required under this section and such insurance has been approved by the Owner, nor shall the Contractor allow any subcontractor to commence work on his/her subcontract until all similar insurance required of the subcontractor has been so obtained and approved. Contractors and subcontractors are required to file with the Owner completed certificates of insurance, as evidence that they carry adequate insurance to comply with the requirement of this section. New Certificates of Insurance shall be furnished to the Owner at the renewal date of all policies named on these certificates.

A. Policies, Coverages, and Endorsements

The Contractor agrees to maintain, or to cause its personnel providing services under this Contract to maintain, at its sole cost and expense or the cost and expense of his personnel, the following insurance policies, with the specified coverages and limits, to protect and insure the Owner and Contractor against any claim for damages arising in connection with Contractors responsibilities or the responsibilities of Contractors personnel under this Contract and all extensions and amendments thereto.

1. Commercial General Liability

a.	General Aggregate	\$3,000,000
b.	Each Occurrence	\$1,000,000

Such insurance shall include, but not be limited to, coverage for:
Comprehensive form, Premises-operations, Explosion and collapse hazard, Underground hazard, Products/completed operations hazard, Contractual insurance, Broad form property damage, Independent contractor, Personal injury

2. Workers' Compensation & Employer' Liability (if applicable)

a.	Medical & Indemnity	Statutory Requirements
b.	Bodily Injury by Accident	\$500,000 Each Accident
c.	Bodily Injury by Disease	\$500,000 Each Employee
d.	Bodily Injury by Disease	\$500,000 Policy Limit
e.	Employers Liability	\$500,000

3. Automobile Liability

Including hired and non-owned Automobiles \$1,000,000 (Combined Single Limit)
Such insurance shall include, but not be limited to, coverage for:
Comprehensive form, Owned vehicles, Hired vehicles, Non-owned vehicles

GENERAL CONDITIONS

GC.2 CONTRACTORS' AND SUBCONTRACTORS' INSURANCE (Cont'd.)

B. ~~Builder's Risk Insurance (Fire and Extended Coverage)~~

~~Until the project is completed and accepted by the Owner, the Contractor is required to maintain Builder's Risk Insurance (fire and extended coverage) on a 100 percent completed value basis on the insurable portion of the project for the benefit of the Owner, the Contractor, and subcontractors as their interests may appear.~~

C. Owner's Protective Liability

The Contractor shall procure and shall maintain during the life of this Contract Owner's/Contractor's Protective Liability Insurance, listing the Owner as the named insured. The minimum limit of liability shall be not less than \$1,000,000.00 per occurrence/aggregate.

D. Insured Parties

All policies shall contain a provision naming The Charter Township of Meridian, it's Board of Trustees, agents, officers, employees, and volunteers as Additional Insured parties on the original policy and all renewals or replacements during the term of this Contract.

E. Acceptable Insurance Companies

All insurance companies required by this section shall be: 1) acceptable to the Owner; 2) authorized to do business in the State of Michigan by the Michigan Department of Licensing & Regulatory Affairs Office of Financial and Insurance Regulations, and 3) have an A.M. Best Company's Insurance reporting rating of no less than A- (Excellent). Upon request, the Contractor shall submit evidence of such insurance.

F. Indemnification and Hold Harmless

The Contractor shall, at its own expense, protect, defend, indemnify and hold harmless the Owner and its elected and appointed officers, employees, and agents from all claims, damages, costs, lawsuits and expenses, including, but not limited to, all costs for administrative proceedings, court costs and attorney fees that they may incur as a result of any acts, omissions, or negligence of the Contractor, its subcontractors, sub-subcontractors or any of their officers, employees, or agents. This includes but is not limited to injury or death to any person or persons, including the contractors employees, and damage to property. The furnishing by the Contractor of any insurance required by this Contract, or the acceptance or approval thereof by the Owner as provided in this Contract, or otherwise, shall not diminish the Contractor's obligation to fully indemnify the Owner, its elected and appointed officers, employees, and agents as required in this section.

The Contractor shall not cancel or reduce the coverage of any insurance required by this section without providing 30-day prior written notice to the Owner. All such insurance must include an endorsement whereby the insurer shall agree to notify the Owner immediately of any reduction by the Contractor. The Contractor shall cease operations on the occurrence of any such cancellation or reduction, and shall not resume operations until new insurance is in force.

GC.3 QUALIFICATION FOR EMPLOYMENT

The Contractor shall employ competent laborers and mechanics for the work under this Contract, and shall comply with all applicable regulations of the United States Department of Labor and any other agencies having jurisdiction.

GC.4 PROGRESS SCHEDULE

The Contractor, if requested by the Owner, immediately after being awarded the Contract, shall prepare and submit to the Owner and its representative an estimated progress schedule for the work in relation to the entire project. This schedule shall indicate the dates for the starting and completion of the various stages of construction.

GENERAL CONDITIONS

GC.4 PROGRESS SCHEDULE (Cont'd.)

If the Contractor chooses to work overtime, they will be backcharged for inspection. Overtime is any Township recognized holiday and/or any time other than 8:00 a.m. to 5:00 p.m., local time, Monday through Friday. No work will be allowed at the site prior to 7:00 a.m. or after 7:00 p.m., or dusk, of any working day. No work will be allowed on Sundays with the exception of work necessitated by an emergency.

GC.5 ACCIDENT PREVENTION

Precaution shall be exercised at all times for the protection of persons (including employees) and property, and hazardous conditions shall be guarded against or eliminated. The Contractor is entirely responsible for all aspects of job safety and shall execute the work under this Contract in strictest conformance with all state and local safety codes, rules and regulations.

GC.6 CONTRACT PRICE SCHEDULE

The Contractor, if requested by the Owner, shall submit to the Owner a cost breakdown for the various items of the work. The schedule shall be prepared in a manner acceptable to the Owner as to both form and completeness and supported by data as necessary to substantiate its correctness.

GC.7 PAYMENT TO CONTRACTOR

The Contractor shall submit semi-monthly, or at longer intervals, if he so desires, an invoice covering work previously performed for which he believes payment, under the Contract terms, is due, and shall deliver said invoice to the Owner. Each request for payment shall be accompanied by a statement certifying that all bills for labor and materials have been paid up for all previous pay requests.

Each progress payment request shall be paid within one of the following time periods, whichever is later:

- A. Thirty (30) days after the Owner has certified that the work is in place in the portion of the facility covered by the applicable request for payment in accordance with the documents.
- B. Fifteen (15) days after the Owner has received the funds with which to make the progress payment from a department or agency of the federal or state government, if any funds for the facility are to come from either of these sources.

To assure proper performance of the Contract by the Contractor, the Owner shall retain ten percent (10%) of the dollar value of all work in place until the 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. In the event of such a determination the Owner may retain up to but not to exceed ten percent (10%) of the dollar value of the work more than fifty percent (50%) in place.

Any funds retained by the Owner shall not exceed the prorated share of the Owner's matching requirement if the project is funded, in part, with federal or state funds. Any retained funds shall not be commingled with other funds of the Owner and shall be deposited in an interest-bearing account in a regulated financial institution.

At any time after ninety-four percent (94%) of the work under the Contract is in place and at the request of the Contractor, the Owner shall release the retainage plus interest, only if the Contractor provides to the Owner an irrevocable letter of credit in the amount of the retainage plus interest, issued by a bank authorized to do business in the State of Michigan, containing terms mutually acceptable to the Contractor and Owner.

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

GENERAL CONDITIONS

GC.7 PAYMENT TO CONTRACTOR (Cont'd.)

Owner and Contractor agree that disputes concerning retainage, at the option of the Owner, shall be submitted to the decision of the agent as provided in Section 4 of Act 524 of the Michigan Public Acts of 1980 (MCLA 125.1564; MSA 5.2949 (104)) and that interest earned on retainage shall be released to the Contractor together with the final progress payment except as provided in said Section 4 of 1980 PA 524.

The final progress payment request by the Contractor shall include:

- A. A final invoice in a form satisfactory to the Owner.
- B. A sworn statement certifying that all bills for labor and materials have been paid by the Contractor.
- C. A sworn statement waiving any further claims (other than the final payment, retainage and interest, if any) by the Contractor against the Owner.
- D. A certificate from Contractor's bonding company approving issuance of final payment.

All payments shall take due account of additions to or deductions from the Contract price as herein provided.

The acceptance by the Contractor of payment on the final progress payment request shall be conclusive evidence of Contractor's acceptance and approval of estimates, accounting and deductions, and of full payment by the Owner for all work, labor, materials and services done or furnished hereunder, and a full satisfaction, discharge, release and waiver of all claims and demands of or on behalf of the Contractor, its agents or employees against the Owner arising out of this agreement.

GC.8 SUBCONTRACTING

The Contractor shall not award any work to any subcontractor, supplier, manufacturer or fabricator without prior written approval of the Owner, which approval will not be given until the Contractor submits a written statement to the Owner concerning the proposed award to the subcontractor. Said statement shall contain such information as the Owner may require.

The Contractor shall be as fully responsible to the Owner for the acts and omissions of his subcontractors and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.

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

Nothing contained in this Contract shall create any contractual relation between any subcontractor and the Owner.

GC.9 ASSIGNMENTS

The Contractor shall not assign the whole or any part of this Contract or any monies due or to become due hereunder without written consent of the Owner. In case the Contractor assigns all or any part of any monies due or to become due under this Contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that the right of the assignee in and to any monies due or to become due to the Contractor shall be subject to prior liens of all persons, firms and corporations for services rendered or materials supplied for the performance of the work called for in this Contract.

GENERAL CONDITIONS

GC.10 EXTRAS

Except as otherwise herein provided, no charge for any extra work or materials will be allowed unless the same has been ordered in writing by the Owner and the price stated in such order.

GC.11 CHANGES IN WORK/PAYMENT ADJUSTMENTS

Adjustments, if any, in the amounts to be paid by the Contractor by reason of changes in, additions to, or deductions from the work to be performed or the materials to be furnished under this Contract, shall be made on the basis of the acceptable unit prices or lump sums submitted by the Contractor covering such changes, additions or deductions.

Failing an acceptable lump sum or unit price basis for extra work caused by changes or additions, the Contractor may be directed to proceed with extra work on the basis of actual total cost of:

- A. Labor, including foremen (including fringe benefits);
- B. Materials entering permanently into the work;
- C. The ownership or rental cost of construction plant and equipment during the time of use on the extra work at a rate not to exceed AGC rates;
- D. Power and consumable supplies for the operation of power equipment;
- E. Insurance;
- F. Social Security and unemployment contributions.

To the cost of the six items above, there shall be added a fixed fee, to be agreed upon but not to exceed fifteen percent (15%) of the actual cost of the work. The single fee shall be compensation to both the Contractor and/or subcontractor to cover the cost of supervision, overhead, bond, profit and any other general expenses.

Failing an acceptable lump sum or unit price basis for adjustment for any decrease in work caused by changes or deductions, the amount of such adjustment may be determined on a similar basis to that described for extra work, with the Contractor furnishing all pertinent cost data from his/her books and records that may be available and necessary for determination of the amount of adjustment.

All changes in, additions to, or deductions from the work specified shall be made only by written order by the Owner or by an authorized representative of the Owner. No claim for extra work will be allowed, unless ordered in writing as above stated, and the claim therefore presented in writing by the Contractor on or before the fifth (5th) day of the month following that in which the work was done.

GC.12 TIME OF MAKING CLAIMS

If the Contractor shall claim compensation or extension of time for any losses, damages, or delays sustained by reason of the acts of the Owner or its agents or other causes, he/she shall make a written statement of the nature of the loss, damage, or delay sustained to the Owner, within ten (10) days after the sustaining of such loss, damage, or delay. At the time of delivery and as a part of the Contractor's Declaration as hereinafter provided, the Contractor shall file with the Owner an itemized statement of the details and amounts of the loss, damage, or delay, and unless the statement shall be made as thus required, the Contractor's claim for compensation or extension of time shall be forfeited and invalidated, and he/she shall not be entitled to payment or extension of time on account of any such loss, damage or delay.

GENERAL CONDITIONS

GC.13 MATERIALS, SERVICES, AND FACILITIES

It is understood that except as otherwise specifically stated in the Contract documents, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, superintendence, temporary construction of every nature and all construction facilities whatsoever necessary to execute, complete, and deliver the work within the specified time.

Any work necessary to be performed after regular working hours, or Sundays and legal holidays, shall be performed without additional expense to the Owner.

GC.14 TERMINATION FOR BREACH

In the event that any of the provisions of this Contract are violated by the Contractor or by any of his subcontractors, the Owner may serve written notice upon the Contractor and the Surety of its intention to terminate the Contract, such notice to contain the reasons for terminating the Contract, and unless within ten (10) days after the serving of such notice upon the Contractor, the violation shall cease and satisfactory arrangements for correction be made, the Contract shall cease and terminate. In the event of a termination of the Contract, the Owner shall immediately serve notice thereof upon the Surety and the Contractor, and the Surety shall have the right to take over and perform the Contract.

However, if the Surety does not commence performance thereof within 30 days from the date of mailing said Notice of Termination to such Surety, the Owner may take over the work and prosecute the same to completion by contract for the account and at the expense of the Contractor. The Contractor and his Surety shall be liable to the Owner for any excess cost incurred by the Owner in completing the work, and Owner may take possession of and utilize in completing the work, all materials, appliances and plants as may be on the site of the work and necessary therefore.

GC.15 OWNER'S RIGHT TO WITHHOLD CERTAIN AMOUNTS AND MAKE APPLICATION THEREOF

The Owner may withhold a sufficient amount of any payment otherwise due to the Contractor to cover:

- A. Payments that may be past due and payable for just claims for labor, materials, or equipment furnished in and about the performance of the work on the project under this Contract.
- B. For defective work not remedied.
- C. For failure of the Contractor to make proper payments to his subcontractors.

The Owner shall disburse and shall have the right to act as agent for the Contractor in disbursing such funds as have been withheld pursuant to this paragraph to the party or parties who are entitled to payment therefrom. Any payment so made by the Owner shall be considered as a payment made under the Contract by the Owner to the Contractor. The Owner will render to the Contractor a proper accounting of all funds disbursed in behalf of the Contractor.

GC.16 SUPERINTENDENCE

The Contractor shall give his/her personal superintendence to the work or have a competent foreman or superintendent, satisfactory to the Owner, on the worksite at all times during work progress, with authority to act for the Contractor.

GENERAL CONDITIONS

GC.17 NOTICE AND SERVICE THEREOF

Where in any of the Contract documents there is any provision in respect to the giving of any notice, such notice shall be deemed to have been given; as to the Owner, when written notice shall be delivered to the Owner, or shall have been placed in United States mails with first-class postage pre-paid addressed to the chief executive officer of the Owner at the place where the bids or proposals for the Contract were opened; as to the Contractor, when a written notice shall be delivered to the chief representative of the Contractor, at the site of the project or by mailing such written notice in the United States mails with first-class postage pre-paid addressed to the Contractor at the place stated in the papers prepared by him to accompany his proposal as to the address of his permanent place of businesses; as to the Surety, when a written notice is placed in the United States mails with first-class postage pre-paid addressed to the Surety at the home office of such Surety or to its agent or agents who executed bonds in behalf of such surety.

GC.18 COMPLIANCE WITH LAW, APPLICABLE LAW, AND VENUE

The Contractor shall comply with all applicable Federal, State, County, and Municipal laws, ordinances, rules and regulations.

This contract shall be construed according to the laws of the State of Michigan.

The venue for the bringing of any legal or equitable action under this contract shall be the County of Ingham, of the State of Michigan. In the event that any action is brought under this Contract in Federal Court, the venue for such action shall be the Federal Judicial District of Michigan, Western District, Southern Division.

GC.19 PERMITS

The Township will secure and pay for the Building Permit from the Meridian Township Building Department. All other permits or licenses which may be needed for prosecution of the work are to be obtained by the Contractor at the Contractor's expense.

GC.20 ROYALTIES AND PATENTS

The Contractor shall pay for all royalties and patents, and defend all suits or claims for infringement on any patent right, and shall save and hold harmless the Owner from loss on account thereof.

GC.21 INSPECTIONS

The Owner and its representative shall at all times have access to the work wherever it is in preparation or progress and the Contractor shall provide facilities for such access and for inspection.

The Owner and/or its representative shall have the right to reject materials and workmanship which are defective, or require their correction. Work on the project may be ordered terminated until correction is made. Rejected workmanship shall be satisfactorily corrected, and rejected materials shall be removed from the premises without charge to the Owner. If the Contractor does not correct condemned work and remove rejected materials within a reasonable time, fixed by written notice, the Owner may remove them and charge the expense to the Contractor.

Should it be considered necessary or advisable by the Owner at 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 materials. If the work is found to be defective in any material respect, due to fault of the Contractor or their subcontractors, they shall defray all the expenses of examination and satisfactory reconstruction. If, however, the work is found to meet the requirements of the Contract, the actual cost of labor and material necessarily involved in the examination and replacement, plus 15 percent (15%) shall be allowed the Contractor.

GENERAL CONDITIONS

GC.22 CORRECTION OF WORK AFTER FINAL PAYMENT

Neither the final payment nor any provision in the Contract documents nor partial or entire occupancy of the premises by the Owner shall relieve the Contractor of the responsibility for negligence or faulty materials or workmanship within the extent and period provided by law, and, upon written notice, he/she shall repair any defects due thereto and pay for any damage due to other work resulting therefrom, which shall appear within **one year** after date of completion and acceptance.

GC.23 PROTECTION OF WORK

The Contractor shall continuously maintain adequate protection of all his/her work from damage and shall protect the Owner's and adjacent property from injury arising in connection with this Contract, and shall be responsible for all damage and/or injury caused by or arising out of his operations.

GC.24 USE OF JOB SITE

The Contractor shall confine his/her equipment apparatus, the storage of materials and operations of his/her workmen to limits indicated by law, ordinances, permits or directions of the Owner and shall not encumber the premises with his materials.

GC.25 "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 a manner so as to exclude manufacturer's products of comparable quality, design and efficiency. The Contractor shall comply with the requirement of the Contract documents relative to the Owner's approval of materials and equipment before they are incorporated in the project.

GC.26 PLANS AND SPECIFICATIONS

The Contractor shall keep on the worksite a copy of the drawings and specifications and shall at all times give the Owner access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like affect as if shown or mentioned in both. In case of difference between drawings and specifications the specifications shall govern. In any case of discrepancy in the figures, drawings or specifications, the matter shall be immediately submitted to the Owner, without whose decision said discrepancy shall not be adjusted by the Contractor, save only at his/her own risk and expense.

The Owner shall furnish from time to time such detail drawings and other information as he/she may consider necessary, unless otherwise provided. The Contractor shall keep such drawings at the site of the work.

GC.27 OWNER'S RIGHT TO DO WORK

If the Contractor should neglect to prosecute the work properly or fail to perform any provision of this Contract, the Owner three (3) days after given written notice to the Contractor and his/her Surety may, without prejudice to any other remedy the Owner may have, make good such deficiencies and may deduct the cost thereof from the payment due to the Contractor.

GENERAL CONDITIONS

GC.28 CLEANING UP

The Contractor shall at all times keep the premises free from accumulations of waste material or rubbish caused by his/her employees or work, and at the completion of the work he/she shall remove all his/her rubbish from and about the work and all his/her tools, equipment, scaffolding and surplus materials and shall leave his/her work clean and ready for use. In case of dispute, the Owner may remove the rubbish and surplus materials and charge the cost to the several Contractors in proportion to the amounts as shall be determined to be just.

GC.29 REPORTS, RECORDS AND DATA

The Contractor and each of his/her subcontractors shall submit to the Owner such schedules of quantities, costs, progress schedules, payrolls, reports, estimates, records, and other data as the Owner may request concerning work performed or to be performed under this Contract.

GC.30 NON-DISCRIMINATION IN EMPLOYMENT

The Contractor shall adhere to all applicable Federal, State and local laws, ordinances, rules and regulations prohibiting discrimination with regards to employees and applicants for employment. The Contractor, as required by law, shall not discriminate against an employee or applicant for employment with respect to hire, tenure, terms, conditions or privileges of employment, or a matter directly or indirectly related to employment because of race, color, religion, national origin, age, sex, height, weight, marital status, or handicap that is unrelated to the individual's ability to perform the duties of a particular job or position. Breach of this section shall be regarded as a material breach of this Contract.

GC.31 DEFINITIONS

The following terms as used in these Contract documents are respectively defined as follows:

- | | | |
|-----|-----------------------|--|
| (a) | "Contractor" | The person, firm or corporation to whom the within Contract is awarded by the Owner and who is subject to the terms hereof. |
| (b) | "Subcontractor" | A person, firm or corporation other than a Contractor, supplying labor and materials or labor for work at the site of the project. |
| (c) | "Project" | The total construction proposed by the Owner to be constructed in part or in whole pursuant to the within Contract. |
| (d) | "Work on the Project" | Work to be performed, including work normally done, at the location of the project. |
| (e) | "Surety" | Any person, firm or corporation that has executed, as surety, the Contractor's performance and/or labor and material bonds securing the attached Contract. |
| (f) | "Owner" | The public body or authority for whom the work is to be performed and as identified in the advertisement and proposal. |
| (g) | "Engineer" | The Director of Public Works and Engineering for the Meridian Township or their authorized representative. |

GENERAL SPECIFICATIONS

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GS.1 DEFINITION

The Contractor shall furnish all materials specified herein, shown on the plans, and required to be incorporated in the work of the Contract. They shall furnish all labor, construction equipment, tools, supplies and facilities required to construct the elements designated by the Contract documents and shall construct all of the designated elements complete and in full conformance with the requirements of these documents. They shall comply with all regulatory provisions of the Contract, General Conditions and the Specifications.

GS.2 ELEVATIONS

All the elevations shown on the plans or referred to herein are in feet above mean sea level datum as established by the United States Geological Survey, unless otherwise noted. The Contractor shall verify all the existing structure locations and elevations at points of connection or possible interference between their work and the existing structures and shall report at once to the Engineer any interference's or discrepancies discovered.

GS.3 QUALITY OF MATERIALS AND EQUIPMENT FURNISHED

All materials and equipment furnished by the Contractor hereunder shall be new and conform to specifications herein.

Materials, supplies, and equipment, whether furnished by the Contractor or the Owner, shall be stored at the site of the work in such manner as not to interfere with traffic, convenience to public or other Contractors on the site or in the vicinity. The Contractor shall be responsible for any damage caused to new or existing structures by reason of such storage or handling of materials, supplies, or equipment.

Flammable materials in portable containers are not to be stored overnight on the site. This includes, but is not limited to, gasoline and diesel fuel for use in construction machinery. Portable containers

GENERAL SPECIFICATIONS

suitably protected, will be allowed overnight at the site, if confined to permanent tanks which are a normal part of the construction machinery.

GS.3 QUALITY OF MATERIALS AND EQUIPMENT FURNISHED (Cont'd.)

Where the Contractor is required to do work within rights of way under the jurisdiction of governmental bodies, they shall meet the requirements of said governmental bodies for work and storage within their jurisdiction. Such requirements must be met as a minimum requirement, and if the specifications given herein impose further limitation on the work, they shall also be met as the required work standard.

The Contractor's attention is directed to the Ingham County Road Department permit specifications, Section 5. Restoration and Maintenance of Right-Of-Way (e.), for dust control requirements.

GS.4 CARE OF EXISTING STRUCTURES

The Contractor shall be solely responsible for any damage to any existing underground services or structures, or to structures and roadway above ground caused by their operations or those of their subcontractors and suppliers.

GS.5 CARE OF NEW STRUCTURES

The Contractor shall use every reasonable precaution to prevent injury to the new structures being constructed hereunder. They shall be responsible to correct all injury or damage resulting from their operations and/or occurring while the work is under their supervisory control. They shall furnish and install such guards, coverings and other protection as may be needed to insure that the structures remain undamaged prior to completion of the entire work.

In the event damage does occur to the finished portions of the work, or to the work in progress, the Contractor shall take such corrective action and measures as may be necessary to repair the damage to the satisfaction of the Engineer.

GS.6 EXISTING PUBLIC UTILITIES

Existing public utilities and underground structures such as pipelines, electric conduits and sewers are shown on the drawings from available information. The Contractor shall, through Miss Dig and any other reasonable measures, verify the exact location of underground utilities for themselves.

The Contractor shall conduct their operations so as not to damage any existing utility whether or not shown on the plans. The Contractor shall correct, at their own expense, any damage or injury that may be caused by them during their operations or damage or injury caused during the operations of their subcontractors or suppliers.

The Contractor shall be responsible for coordinating relocation or repair of existing public and private utilities with the appropriate utility or owner. No extra payment will be allowed for repairs.

If the Contractor desires, or is required by the utility companies, to relocate any power or telephone poles to facilitate their work, any expense encountered from such relocation shall be borne by the Contractor.

GS.7 PROTECTION OF TREES AND SHRUBS

All trees and shrubs encountered along the route of the project shall be protected from damage by the Contractor and saved from harm resulting from any of their operations or operations of their subcontractors and suppliers. Only those trees and shrubs marked for removal on the plans shall be removed. All others will be saved from damage by tunneling or by slightly adjusting the alignment of the project as directed by the Engineer.

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GS.8 SAFETY PRECAUTIONS

During the progress of the work, the Contractor shall maintain adequate facilities for the protection and safety of all persons and property. The Contractor and all their subcontractors and suppliers shall comply with the "Construction Safety and Health Standards" as published by the Michigan Occupational Safety and Health Administration, and to all other local, state and federal laws, ordinances, rules and regulations pertaining to safety of persons or property.

GS.9 SANITARY REQUIREMENTS

The Contractor shall provide adequate sanitary facilities for all persons employed on this Project. The sanitary facilities shall conform in every way to the requirements of the "Construction Health and Safety Standards" as published by the Construction Safety Standards Commission of the State of Michigan.

GS.10 UTILITIES

The Contractor shall make all necessary arrangements for the provision of all utility services required to prosecute the work under this Contract. The Contractor shall pay the costs for such connections and service. Where the Owner has utility service at the site, the Contractor may obtain service by connection to the Owner's service, subject to reasonable regulation of its use and satisfactory agreement as to charges. In the event that the Contractor's use of any or all of the Owner's utility services causes the Owner to have an inadequate supply of such service, the Contractor shall disconnect said service and provide their own separate supply at no cost to the Owner.

All utility services shall be inspected by and meet the requirements of the applicable local codes and governmental bodies.

GS.11 PUMPING AND DRAINAGE

Adequate pumping and drainage facilities shall be provided and water from whatever sources entering the work during any stage of construction shall be removed promptly and disposed of. All pumping and drainage shall be done with no damage to property or structures and without interference with the right of the public, owners of private property, pedestrians, vehicular traffic, or the work of other contractors. Dewatering shall be done in such a manner that the soil under or adjacent to existing structures shall not be disturbed, removed or displaced.

The overloading or obstructing of existing drainage facilities shall not be permitted, and the Contractor shall be solely responsible for damages caused to such existing drainage facilities by their operations. Additionally, sufficient measures shall be utilized to prevent migration of soil from the site due to any pumping or drainage activities.

GS.12 WINTER CONSTRUCTION

The Engineer has authority over approving the prosecution of work which is proposed to be done during the winter months. The Contractor shall provide adequate weather protection, temporary heating and take any other measures which are necessary to ensure that work performed during the winter months is properly installed and protected against damage from freezing.

Reference is made in Division 4 of the Technical Specifications to the requirements for performing concrete construction and masonry construction in cold weather.

GS.13 USE OF FACILITIES BEFORE FINAL COMPLETION

The Owner shall have the right to make use of, during construction, such portions of completed and acceptably tested facilities as it finds practicable. Such use by the Owner shall not relieve the Contractor from responsibility for any defective work which may be subsequently discovered.

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GS.14 TEST OF MATERIALS

All laboratory tests, except as otherwise noted, are to be made at the expense of the Contractor as specified in the Technical Specifications. The Contractor shall furnish satisfactory containers for taking and shipping samples. The name of the laboratory making the test must be submitted by the Contractor to the Engineer for approval.

In all cases "laboratory" refers to an independent laboratory of recognized standing. Acceptance of materials tested shall be based upon compliance with the specifications hereinafter stated for the various items. Where no particular tests are specified, the tests shall be those normally made for determination of the fitness of the particular material. Certificates of tests shall be furnished by the testing laboratory or producer, in triplicate, to the Engineer.

The Owner may require, at its own option and expense, additional mill and/or shop inspection by competent parties. The Owner may require, at its own option and expense, additional field inspection by a qualified inspector.

All materials failing to meet the requirements of the specifications, as determined by test or otherwise, shall be rejected and not used in the work. The cost of testing materials which fail to meet requirements shall be paid by the Contractor. All follow-up testing required shall also be paid by the Contractor. Materials, if rejected at the site, shall be immediately removed therefrom and shall not be used in the work.

GS.15 OTHER WORK

The Contractor shall cooperate with other Contractors on the site or adjoining work to the end that the entire Project may proceed with the utmost harmony and with a minimum of delay.

Where the work under this Contract is to involve work completed under other contracts or existing facilities or structures, the Contractor shall investigate the condition of such other work or facility to determine its suitability for incorporation into the work of this Contract. Any defect or discrepancy in other work of facility making it unsuitable for proper execution of this Contract shall be immediately reported to the Owner who shall order such adjustments in the work of the project as necessary for proper completion, and unless such defect or discrepancy is reported promptly, the Contractor shall be solely responsible for any adjustments in the work as shall be found necessary to properly complete the work on this project.

GS.16 LINES AND GRADES

General control lines and grades will be established by the Owner. The Contractor shall notify the Engineer no less than 48 hours prior to requiring such control. The Contractor shall furnish all stakes and labor for driving them and rodmen to assist the Owner in this work. The Contractor shall carefully preserve the general control lines and grades established by the Engineer. The cost of replacement of stakes which are damaged or lost shall be borne by the Contractor.

Construction lines and grade shall be transferred and set by the Contractor from the control lines and grades established by the Engineer, and the Contractor shall furnish necessary instruments and competent personnel for performing such work, and they shall be responsible for the accuracy of the transferred line and grade. The Owner will check the work at intervals, as it deems necessary, and the Contractor shall make correction of error, if any, at their own expense, as may be required for the proper function and performance of the structure and installed equipment.

GS.17 COMPLETE WORK REQUIRED

It is the intent of the Contract documents to provide that the Project to be constructed under this Contract will be complete and ready for use. Any minor items not specifically called for on the plans or specifications, but which are clearly necessary, are to be included.

GENERAL SPECIFICATIONS

GS.18 PROPERTY MARKERS

The Contractor shall take precautions not to move or destroy any monuments or stakes marking the boundaries of property along or near the work. A licensed surveyor shall reestablish property irons in the proper location if disturbed. Buried property irons shall be extended 1/2" diameter rods. The Contractor shall pay for reestablishment.

GS.19 RECORDS AND MEASUREMENTS

The Contractor shall keep careful records showing measured overall length of underground facilities installed and distances of such from any available line as may be designated by the Engineer. Such records shall be turned over to the Engineer as the work progresses and the records must be accurate and complete.

GS.20 GUARANTEE

The Contractor shall guarantee and shall secure from the manufacturer of each item of manufactured equipment used in the project a written guarantee that all materials and equipment furnished by them shall be first class and free from defects, and the guarantor agrees that they will, upon notice and without delay, make good or repair without expense to the Owner the whole or any part of the equipment furnished by them hereunder, which within a year from date of acceptance of that portion of completed work incorporating such equipment shall fail or develop unfitness for the purpose for which it is intended as a result of any defect in design, material, workmanship, erection or construction.

**INGHAM COUNTY ROAD DEPARTMENT
SUPPLEMENTARY PERMIT SPECIFICATIONS
FOR UTILITY INSTALLATIONS**

As referred to herein:

“Board” shall denote the Board of Ingham County Road Commissioners or its duly appointed agents.

“Utility” shall denote any cable, conduit, pipe, structure, or similar facility installed within the road right-of-way.

“Contractor” shall denote an individual or legal entity contracted to perform a proposed utility’s installation.

1. GENERAL

- a. All proposed utility installations within county road right-of-way shall be reviewed and approved by means of a permit issued by the Board, regardless of the type, size, location, or installation method. The Board shall have absolute authority over any work to be performed within the county road right-of-way and shall exercise said authority at its discretion. The Board reserves the right to impose, at its discretion, cash bond requirements for any permit granted. The cash bond may be used to reimburse the Board for work not performed by the Contractor, restoration of roadways caused by Contractor activities, costs associated with detour signing, and other reasonable expenses incurred by the road commission.
- b. The Board shall have the authority to direct any work or stop any work, permitted or not permitted, that in its opinion is not being performed to the Board’s satisfaction. All costs for corrective work or work stoppages shall be the responsibility of the Contractor.
- c. To issue a utility installation permit, the applicant must provide drawings that illustrate all the work to be performed, the method of installation, and materials to be used. If road or lane closures are proposed, along with the information required below, the approximate start and completion date shall be provided on the permit application.

2. ROAD CROSSINGS

- a. All proposed utility crossings of county roads shall be performed using methods other than open cut methods unless otherwise permitted by the Board. The following are general specifications or provisions to be followed when installing utilities using methods other than open cut methods.
 1. The methods of utility installation described in this section include, but are not limited to, tunneling, bore and jacking, and directional boring. These methods represent preferred installation methods and are employed to allow installation of utility road crossings without closing the road to through traffic or damaging the existing road pavement. The Board, at its discretion, may require that a particular installation method be employed by the Contractor.
 2. When a utility is to be installed by tunneling methods, the tunnel shall be adequately sheeted and shored to prevent the tunnel walls from collapsing and the road pavement from settling or cracking.
 3. When a utility is to be installed by bore and jacking methods, a casing pipe will be required with the utility to be installed inside the casing pipe. The annular space between the utility and the casing pipe shall be filled and sealed using pressure grouting or other approved methods.
 4. All shafts or pits not sheeted and shored shall be located, at least, 10 feet off the edge of road pavement in rural sections and 6 feet behind the back of curb in urban sections.

5. If any settlement or other changes in grade occur in the vicinity of the utility crossing within one year of the work, upon notification the road shall be immediately reconstructed to the proper grade at the Contractor's expense. In addition, damage to the roadway embankment, shoulder, and pavement shall also be immediately repaired to the Board's satisfaction.
 6. Unless otherwise approved by the Board, all utilities shall have a minimum cover of 4 feet below the road surface. Where approved construction plans indicate cover greater than 4 feet, the plan depth shall govern.
 7. All costs for maintaining traffic, including flagging operations, shall be the responsibility of the permitted party. Traffic control shall be erected in accordance with the current edition of the Michigan Manual of Uniform Traffic Control Devices (MMUTCD) or as directed by the Board. Modifications to traffic control measures may be ordered by the Board, at its discretion, and the cost of any modifications shall be the responsibility of the Contractor. Once work is completed for the day, traffic control signs which are not appropriate shall be covered or removed so that the motoring public is made aware of the road's condition and how to safely traverse through the work zone.
 8. If, in the opinion of the Board, traffic conditions warrant suspension of utility installation operations and restoration of a road's full capacity, the Contractor shall comply immediately. All costs associated with such an action shall be borne by the Contractor.
- b. If the Board permits a proposed utility crossing of a county road using open cut methods, the following general specifications or provisions shall be followed:
1. Large projects that involve many utility crossings and or may extend for several months shall be completed in "sections". The intent being, that once a particular crossing, of many, is completed or a 1/4 mile "section" of a multi-mile utility has been installed, the Contractor shall restore the road and right-of-way to the satisfaction of the Board before moving on to the next crossing or section of utility installation.
 2. In general, open cut utility crossings will not be allowed during winter months.
 3. Open cut utility crossings shall be performed during off-peak traffic hours unless specifically permitted by the Board. Off-peak hours vary, but they are typically between the hours of 9:00 am to 3:00 pm.
 4. Unless otherwise approved by the Board, all utilities shall have a minimum cover of 4 feet between the utility and the road surface. Where approved construction plans indicate cover greater than 4 feet, the plan depth shall govern.
 5. All costs for maintaining traffic, including flagging operations, shall be the responsibility of the permitted party. For road closures intended to last one or two days, the contractor will submit a deposit with the permit application, the Ingham County Road Department will set up, maintain, and dismantle the road closure, the actual costs incurred will be subtracted from the deposit and the remainder returned to the contractor. If incurred costs exceed the deposit, the contractor will be billed for the overage. For road closures intended to last an extended period of time, the Contractor shall set up, maintain, and dismantle the closure per the approved detour plan. Regardless, traffic control shall be erected in accordance with the current edition of the Michigan Manual of Uniform Traffic Control Devices (MMUTCD) or as directed by the Board. All traffic control schemes are to be approved prior to the beginning of work. Modifications to traffic control measures may be ordered by the Board, at its sole discretion, and the cost of any modifications shall be the responsibility of the Contractor.

6. If a proposed road closure is not permitted, at least one lane of traffic shall be maintained with proper flagging operations in effect throughout the work day. Road cuts shall be backfilled, flush with the driving surface at the end of each working day, appropriately signed, and opened for overnight traffic. Depending on traffic volumes and other conditions, the Board may require the permit applicant to provide by-pass lanes (either paved or unpaved) to maintain traffic.
7. Maintenance of open cut work zones is the responsibility of the Contractor and shall be in effect 24 hours a day for the duration of the work.

3. PAVEMENT AND GRAVEL SURFACE REMOVAL AND REPLACEMENT

- a. All proposed open cut utility installations or existing utility installations needing corrective reconstruction shall conform to the following specifications or provisions:
 1. All pavement to be removed shall be saw cut, full depth, to its removal limit and carefully removed as to not damage the saw cut edge. All damaged edges shall be subsequently saw cut and removed back to sound pavement. The pavement removal limit shall extend, at least, 1 foot beyond both sides of the open cut trench.
 2. Both bituminous and concrete pavement removal shall have a minimum width of 6 feet, be perpendicular to the centerline of the road, and extend the full width of existing lanes. Diagonal pavement removal and replacements will not be allowed unless approved by the Board.
 3. Concrete pavement removal limits are to utilize existing joints whenever possible. The minimum distance between a concrete replacement slab and an existing pavement joint shall be 5.5 feet unless approved by the Board. The Contractor shall verify concrete pavement removal limits with the Board prior to pavement replacement.
- b. Pavement replacement and gravel road surface restoration shall conform to the following specifications or provisions:
 1. Aggregate base material under pavement shall be a minimum of 8-inches thick and meet MDOT 21AA or 22A aggregate specifications, as determined by the Board. The proposed aggregate base material shall conform to the characteristics of the insitu aggregate base material as much as possible. Bituminous pavement replacement shall either match the existing pavement thickness or be 5-inches thick, whichever is greater, and utilize hot mix asphalt materials that meet or exceed MDOT 13A bituminous mix specifications. Concrete pavement replacement shall either match the existing pavement thickness or be 7-inches thick, whichever is greater, and utilize 4500 psi strength concrete that meets or exceeds MDOT specifications. Concrete pavement patch size and geometry shall be determined by the Board and shall be doweled into adjacent concrete pavement. Aggregate surfaced roads and shoulder material shall be a minimum of 6-inches thick and meet MDOT 22A or 23A aggregate specifications. Aggregate base shall be compacted to 95% of its maximum density, hot mix asphalt is to be compacted to 97% of its maximum density, and aggregate shoulder material shall be sufficiently graded and compacted to prevent standing water and erosion problems.
 2. The finished driving surface shall be installed to conform to the vertical profile of the existing roadway and not exhibit “dips” or “humps” that are noticeable to the motoring public. “Mounding” over excavations to allow for future settlement will not be permitted. If settling or upheavals occur at pavement replacement locations, the Contractor may be required to remedy the situation. Failure to do so may result in a stoppage of subsequent work or denial of subsequent permits.

3. Bituminous pavements shall not be replaced using lifts that exceed 250 lbs/syd (2 1/4 inches thick). A tack coat emulsion shall be applied between successive lifts of bituminous paving.
4. Replacement concrete pavement shall be doweled into adjacent pavement using 18-inch long by #9 and #5 epoxy coated deformed bars. The dowels shall be drilled, inserted 9-inches, and grouted in accordance with current MDOT specifications. Dowels installed along the pavement edge, parallel to the lane lines (#9), shall be spaced at 18-inches on center. Dowels installed along the pavement edge, perpendicular to the lane lines (#5), shall be spaced at 24-inches on center.
5. Composite pavements, such as asphalt overlaying concrete pavement shall be replaced to match the existing pavement structure using the same provisions described above. If approved by the Board, composite pavements may be replaced with full depth asphalt equal in thickness to the existing pavement structure.

4. BACKFILLING AND COMPACTION

- a. All utility trenches, holes, bore pits, and other excavations within the county road right-of-way shall be backfilled with granular material that meets or exceeds MDOT class II material. Excavation backfill shall be placed and compacted to 95% of its maximum density in successive layers that are no more than 12-inches thick. In-place backfill density shall be verified and reported to the Board by an independent testing laboratory. The cost of said verification and reporting shall be the responsibility of the Contractor. The above backfilling and compaction provisions shall apply to that portion of the subgrade that is within the influence of the roadway pavement structure, including the shoulder. Refer to MDOT Trench Detail "B". Failure to meet said backfill and compaction requirements may result in a stoppage of subsequent work, replacement of deficient backfill, and denial of subsequent permits.
- b. All under drain systems and similar facilities destroyed or disturbed due to the utility installation shall be rebuilt using similar materials and in a manner that completely restores their function.

5. RESTORATION AND MAINTENANCE OF RIGHT-OF-WAY

- a. All drainage courses shall be restored with topsoil, seed, and mulch immediately after completion of utility installations. The Contractor shall employ and maintain soil erosion and sedimentation measures to stabilize all disturbed grounds per the Ingham County Drain Commissioner's (ICDC) standards. Disturbed drainage courses or backslopes that have steep grades, as determined by the Board, shall be stabilized with mulch blanket, rock check dams, or both. The Contractor shall follow ICDC and Michigan Department of Environmental Quality (MDEQ) Best Management Practices (BMS) for soil erosion and sedimentation control.
- b. All existing storm sewer, drainage structures, culverts, and similar facilities shall be protected during utility installation. If permitted by the Board and the structure owner, the Contractor may remove and replace said facilities if needed for utility installation. All replacement facilities shall be in accordance with current agency (owner) requirements for materials and construction standards, regardless of existing condition. Any damaged facilities left in place during utility installation shall be fully repaired to the satisfaction of the Board, or be replaced in accordance with current agency (owner) requirements. It is the responsibility of the contractor to research and obtain permission from the appropriate "owner" for the proposed work.
- c. All traffic signs requiring replacement or that need to be relocated due to utility installation shall be replaced or relocated by Ingham County Road Department personnel and their costs reimbursed by the Contractor.

- d. Encroachments (private installations) within the road right-of-way, such as fences, mailboxes, and hedges that must be removed due to utility installation may be replaced or re-installed, within the right-of-way, upon approval of the Board. In general, removed objects, other than mailboxes, cannot be re-installed within the road right-of-way. Please be aware that the Ingham County Road Department will not become involved with negotiations between the utility owner and property owners relative to encroachment removal and replacement, but the Board will ultimately approve or disapprove whether replacements are allowed, and their subsequent locations.
- e. The Contractor shall maintain a safe work area, free from dust and free from dirt and mud being tracked onto the adjacent roadway. The Contractor shall make arrangements to have paved roads swept and gravel roads treated with dust palliative for the duration of installation activities. If requested by the Board, the Contractor shall sweep roads or apply dust palliative within 4 hours of the request. Failure to do so may result in a stoppage of work.

6. MANHOLE CASTING, VALVE, AND FIRE HYDRANT LOCATIONS

- a. Permitted utility manhole structures and vaults shall conform to the following specifications or provisions:
 - 1. In general, proposed manhole castings and valve boxes shall be located outside the paved road surface and somewhere other than in the roadside ditch. If approved by the Board, manhole castings and valve boxes installed within a paved surface or parkway shall be located flush with the existing surface, manhole castings and valve boxes installed within the traveled portion of a gravel road shall be located 6-inches below the road's surface, and manhole castings and valve boxes installed in a ditch bottom shall be located, at least 12-inches below the ditch bottom. The contractor may be required to re-route the ditch around manhole castings and valve boxes, at the discretion of the Board.
 - 2. Manhole castings and valve boxes shall not protrude from the backslope of the road or above the normal ground contour by more than 6-inches. The contractor may be required to adjust a manhole casting or regrade the area, to the Board's satisfaction, at their expense.
 - 3. Proposed manhole casting and valve box type shall be approved by the Board prior to the start of installation. If at any future time it is determined that the type of casting or valve box must be changed due to road reconstruction, widening, resurfacing, etc., the utility owner agrees, by performing under permit, to bear all costs for the change
 - 4. Proposed fire hydrant installations shall be approved by the Board prior to the start of installation. If at any future time it is determined that the fire hydrant must be moved due to road reconstruction, widening, resurfacing, etc., the utility owner agrees, by performing under permit, to bear all costs for moving the fire hydrant.

7. TREE REMOVAL, TRIMMING, AND TUNNELING

- a. All tree removals, trimming, and tunneling within county road right-of-way shall be reviewed and approved by means of permit by the Board of Ingham County Road Commissioners. Any trees, regardless of their location, that cannot be protected due to utility installation or are in eminent danger of dying as a result of utility installation shall be removed by the Contractor. All stumps shall either be removed or ground flush with the average ground surface in the vicinity of the stump.
- b. Proposed tree removals, trimming, and tunneling shall be sufficiently illustrated on construction plans along with the tree's species and size so that a proper review and site visit can be performed.
- c. Trees that are located close to proposed utility installations, in the county road right-of-way, and reside within maintained lawn areas shall be protected from above ground and below ground

damage. Any trees, as described above, that are to be removed due to utility installation, shall only be removed after the Contractor has given notice to the adjacent property of the intent to remove the tree(s) and offered replacement trees. In general, the Board will require the Contractor to replace “lawn” trees removed due to utility installation. Replacement trees shall be planted outside the road right-of-way or at locations approved by the Board.

- d. All stumps, logs, limbs, and litter shall become the property of the utility installation contractor and be properly disposed of. The adjacent property owners have the right of ownership of wood felled within the right-of-way, therefore the Contractor shall offer to leave the felled wood for the property owners use. Wood requested by the property owner shall be left outside of the county road right-of-way.

8. CONDUCT OF OPERATIONS

- a. The Contractor shall control and ensure that trucking operations related to utility installations adhere to the current Michigan Vehicle Code and restrictions imposed by the Board, including spring weight restrictions. Failure to do so will result in the truck operator being ticketed and may also result in a stoppage of work.
- b. Contractors, permitted or not permitted, who conduct utility installation operations in a manner detrimental to the Board’s statutory obligation to maintain county roads reasonably safe for the public will be required to cease utility installation activities and correct all detrimental conditions immediately. If deemed necessary by the Board, cash deposits to cover the cost of a full-time ICRD inspector to ensure proper operations may have to be submitted to the Board before utility installation continues.
- d. Dewatering water disposed of by the Contractor within the county road right-of-way must be approved by the Board in advance of any discharge and conform to Michigan Department of Environmental Quality (MDEQ) Best Management Practices (BMS) for soil erosion and sedimentation control. In general, discharge of water into roadside ditches for more than a couple of hours will not be allowed. If the Board deems it necessary that dewatering activities be modified or discontinued altogether, the Contractor shall comply and devise another method to complete their work. The Contractor, by performing under permit, accepts the responsibility of restoring the road right-of-way and affected drainage system to the satisfaction of the Board and the Ingham County Drain Commissioner after dewatering system removal.
- e. The Contractor shall store construction materials as far off the road so that the materials do not pose a hazard nor block the vision of the traveling public and those seeking egress and ingress to private property. Only materials to be installed immediately can be stored within the right-of-way. All other materials and equipment shall be stored outside of the right-of-way.
- e. For location of underground utilities, the Contractor shall call Miss Dig at 1-800-482-7171 a minimum of three working days prior to utility installation.

Rev. 01-06

EARTHWORK (DIVISION 1)

MERIDIAN TOWNSHIP TECHNICAL SPECIFICATIONS DIVISION 1

EARTHWORK

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1.01 SCOPE

The Contractor shall furnish all labor, materials, tools and equipment for all excavation and backfilling required for work under this contract, including all sheeting, shoring and bracing, dewatering of excavation, and other work as herein specified. All work shall be done in accordance with the current Michigan Department of Transportation Standard Specifications for Construction, except as stated within this specification.

1.02 CONSTRUCTION METHODS

1. Clearing the Site

The Contractor shall clear the site of all brush and debris which may be present and interfering with construction operations and shall remove and dispose of the same. No trees or shrubs are to be removed unless shown on the plans or permitted by the Engineer. Concrete, asphalt, trees, and shrubs shown on the plans to be removed shall be disposed of at a suitable location off the site of the work.

2. Protection of Trees

All trees which are to be preserved or which, in the opinion of the Engineer, might be subject to damage by the Contractor's operations, shall be adequately protected against damage to the bark by 2-inch thick vertical planking securely wired or tied completely around the tree trunk. Such protection shall not be removed until authorized by the Engineer.

No excavation greater than 1 foot in depth shall be made by machine within 5 feet of any tree. If the excavation cuts within the canopy (dripline) of a tree, the Contractor shall tunnel under roots and protect them from injury throughout the work. All roots greater than 2" shall be cleanly cut, if removed.

Trees which interfere with the work, and the removal of which is permitted, shall be removed by the Contractor in a safe manner and incidental to construction unless otherwise noted on plans and proposal. No trees are to be removed without the expressed approval of the governmental body or property owner having jurisdiction thereof, and of the Engineer.

Trees, trunks, and limbs to be removed that are greater than six inches in diameter shall be trimmed and cut into lengths less than eight feet and piled outside of the right of way for use if the abutting property owner so desires. If the property owner does not desire the timber, the timber becomes the property of the Contractor. All other timber, brush, limbs, and stumps shall be disposed of by the Contractor. Onsite burning will not be allowed.

EARTHWORK (DIVISION 1)

1.02 **CONSTRUCTION METHODS** (Cont'd.)

3. Erosion Control

Erosion Control devices shall be installed as shown on the plans and as needed to eliminate the migration of soil from the worksite. Typical devices include catch basin fabric drops (silt sacks) and silt fence. Additional requirements, as necessary, can be found in the Special Provisions.

Fabric drops shall be designed and constructed for use in the specified structure. Drops shall be installed prior to construction, cleaned and maintained in a working state for the duration of the project, and removed and disposed of upon final completion and restoration of the construction site.

Silt fence shall be a product in accordance with the MDOT 2020 SSC, Section 910.

Grass shall be growing before the erosion control measures are removed. Retainage will not be released until the sediment guards are removed.

4. Excavation

A. General

Trench excavation shall be by open cut, except as otherwise shown or permitted. Excavation may be performed by any practical method consistent with the integrity and protection of the work, adjoining structures, and the protection of workers and the public.

Excavation of trenches for piping shall provide a minimum net clearance of six inches outside the barrel of the pipe and, in all cases, shall be of sufficient width to permit the convenient placing of pipe and making of joints. The bottom of the trench shall be shaped so as to conform as nearly as possible to the outside of the pipe, particular care being taken to recess the bottom of the trench in such a manner as to relieve the bell of all load and to provide continuous soil bedding under the lower quadrant of the pipe.

Excavation for structures shall be extended sufficiently beyond the limits of the structure to provide ample room for practical construction methods to be followed.

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 selected material. It shall be thoroughly tamped into place in not more than six inch layers, to the satisfaction of the Engineer, before the construction work proceeds. Alternatively it may be filled with Class B Concrete or Flowable Fill.

Foreign materials such as slabs of wood, boulders, etc. which obstruct the excavation, shall be removed with other excavation; and where such obstructions occur at or near the bottom, requiring excavation below grade for their removal, the excavated area shall be brought back to grade as in the previous paragraph, and incidental to construction. Unnecessary excavation below grade by the Contractor shall be refilled to grade as in previous paragraph, and at the Contractor's expense.

B. Existing Utilities and Structures

The Contractor shall cooperate with all utility firms, in advance, to locate and avoid interference with and damage to existing facilities, insofar as possible. Means for elimination of interference and correction of damage shall be subject to the instruction or approval of the Engineer. Where any apparent conflicts with underground utilities become evident, the Contractor shall excavate the utility in advance of working in the area. The Engineer shall then determine if any conflict exists and, if so, shall determine the action to be taken. Exploration for underground utilities is incidental to the other work performed.

Underground pipes or structures encountered in excavation shall be adequately supported during the Contractor's operations. Before backfilling, the structure shall receive a permanent support of a suitable material approved by the Engineer, extending from the bottom of the excavation to the underside of the pipe or other structure.

EARTHWORK (DIVISION 1)

1.02 **CONSTRUCTION METHODS**

4. Excavation

B. Existing Utilities and Structures (Cont'd.)

The Contractor shall use care not to damage adjoining structures and existing underground utilities. Existing underground pipes and cables are shown on the plans insofar as information is reasonably available. The Contractor shall be responsible to ascertain the locations of all utilities, whether shown on the plans or not.

Work within MDOT and Ingham County Road Department (ICRD) rights of way is done under separate permit from the agency involved. In addition, to these specifications, the Contractor shall adhere to all conditions contained in such permits.

When excavating along paved roads, extreme care shall be taken that the existing pavement and structures will not be damaged or undermined. All sheeting, bracing, and other equipment necessary to prevent damage shall be furnished by the Contractor. Where a trench must be cut through a roadway or driveway, particular care shall be taken not to unnecessarily damage adjoining areas of pavement. Existing pavement shall be sawcut prior to excavation.

Sheeting or other suitable protection, as required, shall be provided wherever excavation is performed adjacent to an existing structure. Any material removed from beneath the foundation of an existing structure shall be replaced with Class B concrete. Sheeting, bracing, and shoring required to support the sides of excavation shall be removed with care after completion of the work. Any injury to the work or to adjacent property resulting from the removal shall be repaired by the Contractor.

The Contractor shall be responsible for any damage caused by their operations to pipes, structures, poles and accessories, and the like above or below ground, whether shown on the plans or not. They shall make good and repair any such damage to the satisfaction of the Engineer. Particular care shall be exercised where excavation or other work is being prosecuted near electric or telephone lines.

C. Ground Water

Excavations shall be kept dry during placing of pipe and initial backfill. The Contractor shall supply stone sumps and pumps as necessary to maintain satisfactory conditions. This work is considered incidental to the pipe cost.

The Contractor shall take all necessary precautions to prevent the accumulation of water to such a level as might cause damaging uplift pressure to partially completed structures. The Contractor shall be responsible for any damage to partially completed structures because of inadequate or improper protection from uplift pressure, and shall repair or remove and replace at their own expense, to the satisfaction of the Engineer, all work so damaged.

D. Dewatering

The Engineer may direct the installation of a dewatering system if they deem it necessary to lower the adjacent water table. This is a pay item which includes all costs to furnish and operate the system, including down-time and remobilization. Only use this method when normal methods, outlined in above paragraph (4C), prove to be insufficient.

5. Backfilling and Rough Grading

A. Bedding and Initial Backfill

The backfilling and bedding of utilities shall not incorporate frozen materials. Trench backfill shall be carefully placed such that pipeline and grade are not disturbed. Bedding and initial backfill shall be as specified for ductile iron, plastic, and concrete pipe in Division 2 and for ductile iron pipe in Division 3 of the Technical Specifications.

EARTHWORK (DIVISION 1)

1.02 **CONSTRUCTION METHODS**

5. **Backfilling and Rough Grading (Cont'd.)**

B. Final Backfill Outside Right of Way

The remainder of the trench, if not in a roadway, may be backfilled with excavated material unless it contains peat, muck, cinders, stones larger than 6" in diameter, or other undesirable material as determined by the Engineer. This undesirable material shall, upon written order of the Engineer, be removed and replaced with Extra Sand Backfill or material approved by the Engineer.

In a field, above a point 12-inches over the pipe, water main trenches may be backfilled completely with loose material and compacted from the top of the trench. Sewer trenches shall be backfilled and compacted in layers of 3'. In lawn areas the layers in each case shall not exceed 12".

Excavated material, above a point 12-inches over the top of the pipe, shall be compacted by running the wheel or track of excavation equipment along the trench or by methods and equipment approved by the Engineer. At least 30" cover over the top of pipe is required for wheeled or tracked vehicles and 48" cover for machine mounted compactors. Temporary mounding of excess material over the trench will be allowed only until such time as lawn repairs are completed.

C. Backfill within Roadway Zone of Influence

Where excavation cuts through a road, drive, or sidewalk, or is in the zone of influence of a pavement, the trench shall be backfilled with granular material and compacted in accordance with MDOT or ICRD specifications, whichever is applicable. Road crossings are incidental to pipe installation. Longitudinal trenches will be paid as the bid item Extra Sand Backfill, unless otherwise specified.

D. Rough Grading

At the end of each working day, all excavations shall be completely backfilled up to existing grade with all excess excavated material being removed from the site. The excavation at the point where pipe installation is to start on the next working day need not be backfilled if it is greater than 6 feet deep, adequately protected, fenced, and lighted. However, in all cases, roadways and driveways should be made accessible overnight.

Excessive soil settlement and any resulting damage which occurs within one year of final approval shall be repaired by the Contractor at no cost to the owner.

6. **Extra Sand Backfill**

When the Engineer deems the native backfill material above the pipe to be unsuitable (such as rocks, peat or landfill outside the right of way or clay within the right of way) they may order extra sand backfill.

The unsuitable material shall be removed from the site and replaced with an approved granular material. This granular material shall be compacted as previously specified for excavated material.

Sand used under paved driveways, for road crossings, for pavement sub-base or for pipe bedding and backfill to a point 12" over the pipe is considered incidental to the project and does not qualify as Extra Sand Backfill, unless it is the result of a plan change.

7. **Extra Stone Bedding**

This item is used, as directed by the Engineer, to replace any unsuitable earth foundation, (such as muck, landfill or rubble), below the pipe bedding or trench bottom. The unsuitable material shall be removed from the site and replaced with one-inch crushed stone.

Stone used for dewatering purposes and for pipe bedding and backfill is considered incidental to the project and does not qualify as Extra Stone Bedding.

EARTHWORK (DIVISION 1)

1.02 **CONSTRUCTION METHODS** (Cont'd.)

8. Restoration & Clean-Up

As construction operations proceed, the Contractor shall follow their operations with a general clean-up which shall include rough grading, removal of debris, temporary replacement of mailboxes, temporary restoration of driveways, etc. The general clean-up shall follow construction such that no more than 1000 feet shall remain uncompleted at any time. Access to individual homes and parcels shall remain uninterrupted during construction operations with all driveways temporarily restored to use at the end of each working day. Temporary driveways and roads shall be maintained by the Contractor during the period of construction.

After all construction has been completed, the Contractor shall finish, grade and rake all areas disturbed by construction. Topsoil shall then be spread on the prepared areas to a depth of 3-inches. All stones and lumps larger than 1-inch diameter plus all roots, litter and other foreign material shall be raked out prior to seeding or sodding.

Lawn areas and vacant land shall be repaired with seeding, fertilizer and mulch. 12-12-12 fertilizer shall be evenly applied at a rate of 200 lbs./acre. Seed shall be MDOT "THM" mixture and shall be sown following or in conjunction with the fertilizer and while topsoil is in a friable condition. Seed shall be evenly sown at a rate of 220 pounds per acre and shall not be sown through mulch. Mulch blankets shall be installed immediately after seeding and shall be pinned in place, unless otherwise specified.

If called for, lawn areas shall be repaired with first-quality commercial lawn sod. The existing sod in the excavated areas shall be cut, trimmed and removed as necessary to accept a minimum 12-inch width of new sod without overlapping new sod onto the existing or without leaving gaps between the new sod and existing. Watering of new sod shall be the responsibility of individual property owners.

Driveways and approaches shall be repaired with material of the same quality, width and thickness as that which existed prior to construction, but shall not be less than the following:

- i. Concrete shall be 6-sack, transit-mixed; formed, jointed and finished to match existing. Slabs less than 24-inches wide shall be removed and replaced with new concrete – see Division 4 of the Technical Specifications for additional requirements.
- ii. Asphalt shall be MDOT HMA 13A, three inches compacted thickness and rolled to a uniform, dense surface. Prior to placing of new asphalt, the existing asphalt shall be trimmed with a concrete saw to straight edges which are parallel with the adjoining roadway. Overlays shall be preceded by an asphalt primer. Thicknesses greater than two inches shall be placed in two layers that have cooled between courses.

It is the intent that upon completion of the work all surfaces will be returned to the standard of profile and conditions that existed prior to this work. All gravel, top soil, seeding, sodding, surface restoration, paving, etc., shall be performed under this contract. Surface restoration shall include replacement of mailboxes, posts, fences, signs, culverts, ditches and other miscellaneous improvements. No deviations from existing conditions will be allowed without the written permission of both the Engineer and the affected property owner.

MERIDIAN TOWNSHIP STANDARD SPECIFICATION

WATER DISTRIBUTION SYSTEM

DIVISION 3

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3.05 TESTING AND STERILIZATION

1. Pressure Testing
2. Sterilization and Bacteriological Testing

3.01 SCOPE

The contractor shall furnish all labor, equipment and materials to completely construct, test, and place in operation the water system as shown on the plans and as specified herein.

3.02 **WATER MAIN MATERIALS**

All pipes, piping fittings, plumbing fittings, and fixtures that are used for potable water must comply with the new lead-free requirement and must bear the mark NSF/ANSI Standard 61, Annex G or NSF 61-G.

1. **Pipe**

- A. **General**: All pipe used for main lines shall be ductile iron meeting the requirements of ANSI/AWWA C151/A21.51. Where these specifications differ with ANSI/AWWA C151/A21.51, these specifications will prevail.
- B. **Joints**: The bell of each length of pipe shall provide for the seating of a single rubber gasket meeting the requirements of ANSI/AWWA C111/A21.11 Standards. The gasket shall be self-centering when the plain end of a pipe enters the bell. Sufficient lubricant shall be furnished to provide a coating on each plain end of pipe. The lubricant shall be non-toxic, shall impart no taste or odor to the water and have no deleterious effect on the rubber gasket. The lubricant shall be of a consistency that can be easily applied to the pipe in hot or cold weather and shall adhere to either wet or dry pipe.
- C. **Cement Mortar Lining**: Cement Mortar lining of pipe shall conform to ANSI/AWWA C104/A21.4, except for the following items. Care shall be taken to insure that no mortar remains in the joint surface of the bell. If mortar is found in the joint surface or lining of greater thickness than allowed, the pipe will be returned.
- D. **Length of Pipe**: The minimum nominal laying length of the pipe shall be 18 feet. A maximum of 20 percent of the total number of each size of an order may be furnished as much as 24 inches shorter than the nominal laying length; an additional 10 percent may be furnished as much as 6 inches shorter than nominal laying length.
- E. **Pipe Thickness**: Ductile iron pipe shall have a wall metal thickness as follows:

6-inch pipe	0.37 inch (Class 54)
8-inch pipe	0.39 inch (Class 54)
12-inch pipe	0.43 inch (Class 54)
16-inch pipe	0.46 inch (Class 54)
20-inch pipe	0.48 inch (Class 54)

Tolerances will be as allowed in ANSI/AWWA C151/A21.51. Pipe sizes not listed above will not be approved for use as main lines in the Township water system.

- F. **Coating**: The inside and outside of the pipe shall be coated with a bituminous coating of either coal-tar or asphalt base one mil thick.
- G. **Independent Tests**: The supplier shall furnish reports of all tests and inspections as required in ANSI/AWWA C151/A21.51.

3.02 WATER MAIN MATERIALS (Cont'd.)

2. Fittings

All fittings shall be mechanical joint ductile iron, shall be short bodied and conform to ANSI/AWWA C153/A21.53 or ANSI/AWWA C110/A21.10 Standards. Ductile Iron fittings shall be designed for a working pressure of 350 pounds per square inch (psi).

Seal coating with bituminous material of the fittings shall conform to ANSI/AWWA C104/A21.4 Standard. Fittings shall be bituminous coated inside and out.

All mechanical joint accessories including glands, rubber gaskets and bolts shall be furnished for each joint opening and shall conform with ANSI/AWWA C111/A21.11, except cast bolts are not permitted.

Tapping sleeves shall be from the same manufacturer as the valve. They shall be ductile iron (ASTM A536 Grade 65-45-12), or stainless steel. The flange dimensions and drilling shall comply with ANSI B16.1 Class 125 with MSS SP-60. The mechanical joint shall comply with AWWA C111.

3. Valves

Valves shall be iron body, bronze mounted, double disc, and parallel seat gate valves conforming to AWWA C-500 or resilient seated gate valves conforming to AWWA C-509. The valve ends shall be mechanical joints with glands, bolts, and gaskets furnished. The stem seal shall be of the double "O" Ring design. The operating nut shall be a standard 2-inch square. The valve shall have a non-rising stem, open left inside screw. All bolts, pins and fasteners used for attachments in the disk or wedging mechanism shall be bronze.

The wedge rubber shall be permanently bonded to the wedge in a process meeting the requirements of ASTM D429.

Gate valves shall be EJIW FlowMaster® series with an EJIW screw-type valve box,

Valves greater than 12 inches shall be butterfly type meeting the requirements of AWWA C504. Butterfly valves shall have a 150-pound per square inch rating with the seat molded, vulcanized and bonded to the body. Ends shall be mechanical joints with glands, bolts, and gaskets furnished. The valve shall open left with a minimum of 32 turns, have a non-rising stem and a standard 2-inch square operating nut. Valves shall be equal to those manufactured by Traverse City Iron Works, Dresser Manufacturing, Henry Pratt Company or equal as approved by Engineer.

4. Valve Boxes

Valves smaller than 12-inch shall be fitted with a valve box. The valve boxes shall be cast iron, screw type, three piece, consisting of the base, the center section and the top section. The length shall be adjusted by means of threads cast into the top and center section. The center section shall lock into the base. A cover shall be furnished marked "Water".

The base shall be No. 6 Round and the shaft shall be 5-1/4 inch. The size shall provide for a range of extension of 55-75 inches from the top of pipe.

The valve boxes shall be Tyler Series 6860 or Clow F2450, or as approved by Engineer.

3.02 WATER MAIN MATERIALS (Cont'd.)

5. Fire Hydrants

The fire hydrants shall have a center stem with double "O" Ring packing. The hydrant valve shall be 5-1/4 inch in diameter. The barrel and head shall be cast iron with a breakable traffic safety flange. All fire hydrants shall conform to AWWA C502 Specifications.

The drain mechanism shall drain the hydrant barrel down to the level of the valve seat. The hydrant head shall contain the hose nozzles and be able to face in any of eight positions without digging up the hydrant. The hydrant head shall have two 2½-inch hose nozzles and one 4-inch pumper connection. Each nozzle cap shall be attached to the hydrant with a non-linking chain. The inlet connection shall be 6-inch mechanical joint.

The depth of trench shall be 5½ feet. Threads shall be Meridian Township Standards.

The hydrants shall open left with a standard 1½-inch pentagon nut, shall be painted OSHA red and shall be East Jordan Iron Works 5 BR. The hose nozzle threads shall be #4 (2 ½" National Standard Thread). The pumper nozzle shall be fitted with the "Harrington Integral Hydrant Storz" nozzle.

6. Bolts

No cast iron bolts shall be used. All bolts shall meet approval of Engineer.

3.03 INSTALLATION METHODS

1. Pipe [Ref. Sec. 1.02]

The installation, handling, and storage of all pipe and appurtenances shall be in accordance with AWWA Standard C-600 and manufacturer's recommendations. Pipe shall at all times be protected against impact shocks and free fall. Stockpiling of pipe and appurtenances at the site shall be in such a location as to minimize handling and prevent collecting or submergence with water.

A water main shall be separated from a sanitary sewer crossing by 18" vertical and a 10' horizontal separation when parallel. The trenching method for Class 54 ductile iron shall be AWWA Type 1: flat bottom (undisturbed earth), loose backfill.

The depth of trench shall be such that the top of the pipe shall not be less than five feet below the proposed finish grade, unless otherwise shown on the plans or so ordered by the Engineer. The trench shall be of such width as will readily permit the laying, handling and assembling of the pipes in the trench and to allow a thorough filling and compacting of the earth refill adjacent to the lower half of the pipe. Holes, no larger than necessary, shall be provided for the bells at each joint and to ensure that the pipe barrel will lie flat on the trench bottom. Blocking of pipe will not be allowed.

After the trench has been excavated, the pipe, fittings, valves and hydrants shall, after first being inspected and the joints cleaned, be carefully placed into the trench in such a manner as to prevent damage to them. Under no circumstances shall water main materials be dropped or dumped into the trench. All lumps, blisters and excess tar coating shall be removed from the bell and spigot ends of each pipe and fittings. The outside of the spigot and the inside of the bell shall be wire brushed and wiped clean and dry before the pipe is laid. Any damage to the exterior coating of the pipe shall be repaired with an approved coating before the pipe is laid. After placing a length of pipe in the trench, the spigot end shall be lubricated and then entered in the bell and the pipe forced home and brought to correct line and grade. Lubricants recommended by the pipe manufacturer and approved for use on potable water systems shall be applied as recommended. Due care should be used to seat the gasket evenly in the bell at all points.

3.03 INSTALLATION METHODS**1. Pipe** [Ref. Sec. 1.02] (Cont'd.)

The plain end of the slip type joint is furnished with a slight taper to ease its sliding fit with the gasket when the joint is made up. When necessary to cut pipe in the field, the outside of the cut end should be tapered by filing or grinding back about 1/8 inch at an angle of about 30 degrees with the centerline of the pipe.

A plug shall be used during any breaks in construction to prevent any possible contamination. If the trench contains any water, the open ends of the pipe shall be plugged with a watertight plug.

To form a long-radius curve or to avoid obstructions, the pipe may be deflected within the tolerances recommended by the manufacturer and approved by the Engineer. Some common deflections from AWWA C-600 are:

Diameter	Push-on Joint Max. Offset		Mechanical Joint Max. Offset	
	18'	20'	18'	20'
6"	19"	21"	27"	30"
8"	19"	21"	20"	22"
12"	19"	21"	20"	22"
16"	11"	12"	13½"	15"

Backfill for a Type 1 trench requires no compaction. When under existing or future roadways or lawns, then specified density procedures shall prevail.

Polyethylene encasement of pipes will be required in areas with corrosive soils including swamp, marshes, alkaline soils, cinder beds, landfill areas or any other potentially corrosive location. The encasement thickness shall be 8 mil minimum and installed in accordance with ANSI/AWWA C105/A21.5.

2. Valve Manholes

Valves 12 inches and greater shall be installed in a valve manhole. All tap valves shall be installed in manholes. The size of the manholes shall be 5' in diameter for existing mains that are smaller than 12", and 6' in diameter for 12" mains and larger. The manhole covers shall have "Meridian Township Water" cast into the top.

3. Setting Valves and Boxes

All valves shall be set with the stem in a vertical position and shall be plumb. Valve box shall be so set that it will not transmit shock or stress to the valve. It shall be centered over the stem nut of the valve and shall be true and plumb. The box shall be adjusted so that the cover is flush with the finished ground surface or as directed by the Engineer. Stone shall not be placed around the valves.

4. Setting Fire Hydrants

Fire hydrants shall be located as shown on the plans, or as directed by the Engineer. All hydrants shall be set to a grade that will place the 4" hose nozzle twenty-one (21) inches above the ground surface, unless otherwise directed by the Engineer. Sufficient barrel extensions shall be furnished and installed by the contractor to meet this requirement.

Each hydrant shall be connected to the main by a 6-inch branch. A 6-inch gate valve shall be installed in each hydrant connection. The hydrant and valve shall be connected to the mainline tee by 3/4-inch rods as shown in the detail on the plans.

3.03 INSTALLATION METHODS

4. Setting Fire Hydrants (Cont'd.)

Excavation for each hydrant shall extend at least twelve inches (12") below the base of the hydrant and shall have an area of at least four square feet. Before setting the hydrant, the excavation shall be filled to the elevation of the hydrant, base with washed or broken stone. After the hydrant is set and securely blocked, additional washed or broken stone shall be placed around the base of the hydrant to an elevation of twelve inches (12") over the 6-inch branch connection.

5. Thrust Blocks

All bends, stub ends, plugs and any other portion of the system which may be subject to separation of joints because of water pressure shall be securely thrust blocked. Blocking shall be concrete poured in place and shall be so placed as to prevent any movement of pipe or fitting joints due to water pressure. Size and shape of blocks shall be in accordance with the details shown on the plans.

3.04 WATER SERVICES

1. Pipe Material

Allowable sizes are 1-inch, 1½-inch, 2-inch, 3-inch, 4-inch, or as specified for mains.

Material for 3- and 4-inch shall be Class 54 ductile iron as specified for mains. Material for 1-inch, 1½-inch, and 2-inch shall be Type K annealed seamless copper tubing conforming to ASTM B-88.

2. Service Fittings

Corporation stops, curb stops and unions shall be only Mueller 110 compression style, or Township approved "Ford" fittings. The inlet on the corporation stop shall have AWWA threads.

Curb boxes for new construction shall be only Minneapolis Pattern, 4½-foot depth, cast iron.

Double strap service clamps shall be used with 1½-inch and 2-inch corporation stops.

3. Installation

All service pipe shall be buried 5 feet below finished grade. Curb box locations under driveways and sidewalks shall be prohibited.

Joints shall be made using three-part unions as described above. Solder and band type couplings will not be allowed.

Water and sewer service lines may be installed in a common trench if a minimum horizontal separation of 3.0 feet is maintained.

4. Inspection

All service lines shall be inspected by Township personnel prior to being backfilled. The contractor shall notify the Township a minimum of 6 hours prior to inspection. Any services which are backfilled prior to being inspected shall not be approved and the contractor shall be responsible for all costs of exposing the services.

5. Guarantee

The contractor and/or developer shall be responsible indefinitely for the correct elevation and measurements of house services and curb boxes. If a curb box or house service cannot be found, is not at the correct elevation, or has been installed improperly, the contractor will be notified of the situation. He will then be required to pay for finding the curb box or house service, fixing the installation, or reinstallation, whichever the case may be.

3.05 TESTING AND STERILIZATION

1. Pressure Testing

The contractor shall furnish equipment for the test, and the test shall be run by him in compliance with AWWA C-600 and under the direction of the Engineer. The test shall be made at 150 pounds per square inch hydrostatic pressure and shall be maintained for at least (2) hours and the leakage shall not exceed 11.65 gallons per day, per mile of pipe, per inch of nominal diameter. The contractor shall furnish all labor and equipment to make the test.

All valves shall be opened such that all air in the line can be removed upon filling with water. The contractor shall install any corporation stops necessary to allow the air to be expelled.

Upon opening all valves the test will begin. If the line is a dead end, the 1st hour of the test shall be against the last hydrant. After 1 hour of testing the dead end valves shall be closed and all bleeder lines (dead end hydrants) shall be opened. The test will continue for the remaining 1 hour. If the line is not dead end, the test will be a continuous 2 hours.

The contractor shall run a preliminary test to determine that all air has been expelled and to check for any leakage. If any leakage should exist the contractor shall make the necessary repairs and perform the preliminary testing until satisfactory results are obtained. The final test shall be made in the presence of the Engineer. The contractor shall notify the Engineer in advance of the testing a minimum of 48 hours. The contractor shall provide the equipment necessary to add and measure the water necessary to maintain the hydrostatic pressure within 5 pounds per square inch (psi) of the required test pressure for the duration of the test. When the testing period is complete the contractor shall add and measure the water to bring the final pressure reading to the initial pressure reading. The total gallons added during the duration of the test shall not exceed the allowable leakage.

2. Sterilization and Bacteriological Testing

Disinfection and bacteriological testing shall be in accordance with AWWA Standard C-651. Before the mains are chlorinated, they shall be thoroughly flushed. All mains shall be chlorinated for a period of twenty-four (24) hours. The contractor shall furnish all necessary equipment and materials, and the work shall be done under the direction of the Engineer in accordance with all local and state health department regulations. Chlorine shall be added in sufficient quantity to give a 50-ppm residual of free chlorine after a twenty-four (24) hour period.

After completion of the chlorine procedure, the main shall be flushed. Then the Engineer shall take a sample of water from the main for bacteriological tests. If the tests should result in unsafe conditions, the chlorinating shall be repeated by the contractor. The contractor shall be responsible for all costs associated with necessary retesting.

CONCRETE WORK (DIVISION 4)

MERIDIAN TOWNSHIP TECHNICAL SPECIFICATIONS DIVISION 4

CONCRETE WORK

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4.01 SCOPE

This work shall consist of furnishing all labor, materials and equipment necessary for the proper mixture and placement of concrete. The current MDOT Standard Specifications for Construction (SSC) shall be followed, unless otherwise specified.

4.02 MATERIALS

1. Supplier

The use of transit-mix concrete is required. The Contractor shall notify the Engineer who the supplier will be prior to beginning work. The Engineer must approve the concrete supplier and the mixer trucks used to transport the concrete.

2. Concrete Mixture

Batching and mixing operations shall conform to ASTM C94. Water shall not be added to the mix after the trucks leave the batching plant. The mix for sidewalk shall be MDOT P1 with approximated proportions of one part cement; two parts fine aggregate, and three parts coarse aggregate. The mix shall contain 6 sacks of cement per cubic yard, with a maximum allowable slump of 3½" (three and one-half inches).

Coarse aggregate shall conform to MDOT 6AA. Fine aggregate shall conform to MDOT 2NS. Cement shall be Type 1A air-entraining Portland cement conforming to ASTM Specification C150 or Type 1 with an air entrainment admixture. Air shall be 6% plus or minus 1%.

The compressive strength of Class A concrete shall not be less than 3,500 pounds per square inch (psi) after 28 days. The compressive strength of Class B concrete shall not be less than 3,000 psi after 28 days.

CONCRETE WORK (DIVISION 4)

4.02 **MATERIALS**

2. **Concrete Mixture** (Cont'd.)

Water shall be clean and free from deleterious substances such as oil, alkali and organic matter. Potable water shall be used from sources approved by the Engineer.

No admixtures will be used unless approval is received from the Engineer, or is specified. Admixtures, if approved, shall be used in strict accordance with manufacturer's directions and shall conform with applicable ASTM Standards.

3. **Reinforcing**

Concrete slabs, walls and footings shall be reinforced with steel bars or mesh as shown on the plans. Bars shall be rust-free, new deformed billet-steel conforming to ASTM A615, Grade 60 and mesh shall conform to ASTM A1064.

The Contractor shall prepare and submit to the Engineer shop drawings showing bending and assembly diagrams, splicing, laps of bars, shapes, dimensions and details of bars. Scaled dimensions from drawings shall not be used in determining the lengths of reinforcing bars.

4.03 **CONSTRUCTION METHODS**

1. **Subgrade Preparation**

The earthgrade shall be prepared by removing the topsoil, vegetative cover and root mat. The base shall then be prepared by excavating and/or placing of embankment material to achieve the grade and cross-section required. All soft and yielding material shall be removed and replaced with acceptable material.

When a pathway is benched into cut or fill slopes, grading shall be done in accordance with the MDOT 2020 SSC, Section 205, Roadway Earthworks. Subgrade density shall be not less than 95% of Maximum Unit Weight in fills. In cuts, the Engineer will visually inspect the grade and may order additional compaction to achieve the desired subgrade density.

A minimum of three (3) inches of Class II granular material shall be used under all pathway construction. The base shall be smoothed, trimmed and compacted prior to placement of forms. The Engineer may order additional compaction to achieve the desired subgrade density after visual inspection.

2. **Formwork**

All concrete work shall be accurately formed to the lines and grade shown on the plans. Forms shall extend to the full depth and width of the specified concrete surface. Forms shall be shored and braced from the outside to maintain ¼" tolerance in thickness, line and grade. All formwork shall be oiled with an approved non-staining form oil before placing concrete. Formwork shall be left in place until the concrete is sufficiently hard so as to not be damaged upon removal.

Construct all formwork to provide continuous, straight, smooth surfaces and edges. Exposed edges to have ½" chamfer. Curved walks shall be formed on a radius with flexible forms.

CONCRETE WORK (DIVISION 4)

4.03 **CONSTRUCTION METHODS** (Cont'd.)

3. **Placement**

All formwork and reinforcement placement shall be inspected by the Engineer prior to placement of concrete. The Contractor shall give ample notice and time so that such inspection can be made.

No concrete shall be deposited until the area has been dewatered and not until after the Contractor has made satisfactory provisions to eliminate all possibility of water entering or flowing through the concrete while it is being poured or is curing.

Subgrades shall be wetted and forms shall be oiled prior to concrete placement. All debris shall be removed from forms and reinforcement.

Time Between Charging Mixer and Placing Concrete (minutes)			
Type of Unit	Concrete Temperature (ASTM C1064)		
	<60 °F	60 °F - 85 °F	>85 °F
Truck Mixers	90	60	45
Truck Mixers with Concrete containing Water-Reducing Retarding Admixture	120	90	70

Exposed concrete shall not be poured when the atmospheric temperature is below 40 °F or when the concrete temperature is below 55 °F as placed. Concrete shall not be poured on frozen ground. Concrete shall not be cast if the temperature of the concrete is above 90 °F.

~~Tickets shall be prepared in accordance with the MDOT 2020 SSC, Section 602, Portland Cement Concrete For Pavements.~~

When placement of concrete is started, it shall be carried on as a continuous operation until the placement of the section is completed. Concrete in walls shall be placed in 24-inch lifts keeping surface of concrete level throughout. Concrete shall be deposited to the full depth of the forms in one pour. Drops of greater than 5' shall use tubes.

Reinforced concrete greater than six inches in finished thickness shall be compacted by high frequency internal vibrators. The concrete shall be thoroughly worked around the reinforcement and into the corners of the forms, using procedures which minimize air pockets and honeycombs. Care shall be taken in vibrating concrete so as not to move reinforcement out of place.

Concrete less than six inches in finished depth shall be compacted by spading along all edges and joints and by alternately tamping and striking off the surface until all voids are removed.

4. **Finishing**

Horizontal, exposed surfaces shall be floated and troweled just enough to produce a smooth, dense surface, free from irregularities. All joints and edges shall be rounded to a radius of one-quarter inch by the use of an approved edging tool. After completion of floating and finishing, a fine brush shall be drawn across the finished surface to remove tool marks, and provide a non-slip surface.

CONCRETE WORK (DIVISION 4)

4.03 **CONSTRUCTION METHODS**

4. **Finishing (Cont'd.)**

Formwork panels are intended to provide a satisfactory finish for vertical, exposed surfaces. Finishing shall be limited to minor rubbing, removal of fins and patching of honeycombed areas. Unexposed surfaces need not be finished except for patching of honeycombed areas.

All concrete sidewalk and driveway approaches shall be legibly stamped with the name of the Contractor and the year, with figures 1½" to 2½" tall. The stamps shall be used at the ends of each segment, each truck load, and at intervals no greater than 100 feet in length.

5. **Joints**

1. Construction cold joints not indicated on the plans shall be so made and located so as to least impair the strength of the structure. The location of all construction joints shall be approved by the Engineer. Slabs shall have a cold joint at the end of each truck load.
2. Transverse expansion joints ½" thick shall be placed in sidewalk at approximately 100 foot intervals. ½" thick expansion joints shall be placed anywhere that the walk meets the back of curb, and where the walk meets the edge of concrete driveways or building walls.

Expansion joints material shall be pre-molded of bitumen filled fiber placed at right angles to the line of the walk, perpendicular to the surface and shall extend from ¼" below the surface of the walk to the subgrade.

3. Contraction (plane of weakness) joints shall be placed at a minimum distance equal to the width of the sidewalk. Contraction joints for bicycle pathways (7-foot width) shall be spaced approximately nine feet apart. The joint shall be sawed to a width of 1/8" and to a depth of ¼ of the slab thickness.

Sawing must be accomplished as soon as the concrete has hardened such that no excess raveling or spalling occurs, but before any random cracks develop. Joints shall be at right angles to the line of the walk, and perpendicular to its surface. Tooled joints are not allowed.

6. **Curing and Protection**

Sidewalks and other slabs on grade shall be treated with a curing compound conforming to the requirements of ASTM C309. The compound shall be sprayed or rolled on to provide a continuous film over the entire surface of the walk after completion of finishing, and as soon as all free water has left the surface. Compound shall be applied at the rate of not less than one gallon per 200 square feet. Immediately upon removing sidewalk forms, the exposed concrete edge shall be sprayed with curing compounds or backfilled with earth. The final grading of topsoil will be such that the mature sod will be ½" below the concrete.

All concrete shall be protected from vehicles for the first 72 hours after placing. The period of protection will increase to 7 days as the temperature decreases to 40 degrees. Any concrete found to be defective or damaged due to weather, vandalism, or other causes shall be removed and replaced, at the Contractor's expense. Damaged sections of sidewalk and curb and gutter shall be removed back to the nearest joint or as indicated by the Engineer.

Freshly placed concrete shall be protected from rain by covering with polyethylene film.

CONCRETE WORK (DIVISION 4)

4.03 CONSTRUCTION METHODS

6. Curing and Protection (Cont'd.)

Concrete shall not be allowed to freeze for 72 hours. Protection must be provided when there is a forecast for freezing.

Barricades shall be placed at the areas under repair from the time the damaged section is removed until it is ready for use. Lighted barricades will be required for intersection areas left under repair overnight.

4.04 TESTING

The Contractor shall make arrangements for and coordinate various concrete tests as ordered by the Engineer. The testing company will be selected by the Township and the Township will pay for the tests. The Contractor will be charged for any waiting time suffered by the testing company. All tests will be done according to ASTM standards.

**MERIDIAN TOWNSHIP TECHNICAL SPECIFICATIONS
DIVISION 7**

PAY ITEMS, METHOD OF MEASUREMENT & BASIS OF PAYMENT

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7.04 RAMP PAY ITEMS (SCHEMATIC)

7.01 SCOPE

It is intended that payment for all work done under the Contract Documents including the furnishing of all labor, equipment and materials and the performing of all operations in connection with the construction of the project, will be made under the following pay items. Other work for which there is not a specific pay item will be considered included in the Contract Unit Price for the various specified pay items and no additional compensation will be allowed.

The Owner reserves the right to alter the plans, extend or shorten the improvement and increase or decrease the quantities of work to be performed to accord with such changes, including the deduction or cancellation of any one or more of the Pay Items. Such changes shall not be considered as a waiver of any conditions of the Contract nor to invalidate any of the provisions thereof. A supplemental agreement between the Contractor and the Owner will be required when such changes involve a net increase or decrease in the total amount of the original contract of more than 25 percent. For a net increase or decrease of less than 25 percent, the Contractor will accept payment according to contract prices for such items of work as appear in the original contract.

The work will be done in compliance with the Contract Documents and paid for under the Pay Items or Contract Items herein listed. The Contractor shall take no advantage of any apparent error or omission in the plans or specifications, and the Engineer shall be permitted to make such corrections and interpretations as may be deemed necessary for the fulfillment of the intent of the Contract.

7.02 SPECIFIC PAY ITEMS

1-19 GENERAL

1. Traffic Control

- A. Description: The Contract Unit Price on this item includes labor, equipment, and material necessary to complete traffic control for this project in accordance with the Michigan Manual of Uniform Traffic Control Devices and, as applicable, Michigan Department of Transportation (MDOT) or Ingham County Road Department (ICRD) requirements.
- B. Method of Measurement & Basis of Payment: This item will be paid for at the Contract Unit Price on the following basis: after first use of traffic control measures, 25% will be paid; once 50% of the original contract price is completed, 50% will be paid; once 75% of the original contract price is completed, 75% will be paid; once the contract work is complete, 100% will be paid.

2. Road Repair

- A. Description: The Contract Unit Price on this item includes restoration of all public roads to at least their conditions as existed prior to the start of construction. Specific examples are furnishing and placing of subbase, gravel or asphalt base and gravel, asphalt or concrete surface plus all other miscellaneous work associated with the complete restoration of all public roads including shoulders. All work shall be done in accordance with the plans and specifications.
- B. Method of Measurement & Basis of Payment: This item will be paid for at the Contract Unit Price when all public roads have been restored to their original condition.

7.02 SPECIFIC PAY ITEMS

1-19 GENERAL (Cont'd.)

3. Extra Sand Backfill [Ref. Sec. 1.02 (E)]

- A. Description: When the Engineer deems the native backfill material above the pipe to be unsuitable (such as rocks, peat or landfill outside the right of way and clay within the right of way) the Engineer may order extra sand backfill. It includes the excavation and disposal of the unsuitable material. Fill material shall be Class II granular material and placed at the direction of and to the satisfaction of the Engineer.

Sand used under paved driveways, for pavement subbase at road crossings, or for pipe bedding and initial backfill is considered incidental to sewers or water main and will not be paid for under this item.

- B. Method of Measurement & Basis of Payment: This item will be paid for at the Contract Unit Price for the total volume actually furnished and placed. Volume will be determined compacted-in-place (CIP) by measurements obtained at the site unless otherwise stated.

4. Extra Stone Bedding [Ref. Sec. 1.02 (F)]

- A. Description: The Contract Unit Price on this item includes the furnishing and placing of crushed stone bedding material to replace unsuitable subgrade material under the pipe. This work shall be done at the direction of, and to the satisfaction of, the Engineer.

Stone used for dewatering purposes or to stabilize water sand is considered incidental to sewers or water main and will not be paid for under this item.

- B. Method of Measurement & Basis of Payment: This item will be paid for at the Contract Unit Price for the total volume actually furnished and placed. Volume will be determined in place by measurements obtained at the site unless otherwise stated.

5. Road and Railroad Crossing

- A. Description: The Contract Unit Price on this item includes all extra work over and above that described under Sewers, Site Restoration, and Road Repair herein. Specific work includes furnishing and installing the steel casing pipe (by methods other than open cut), placing crushed stone around the carrier pipe, sealing the casing ends plus all miscellaneous related work.

- B. Method of Measurement & Basis of Payment: This item will be paid for the Contract Unit Price after the work is completed. The lineal footage of pipe installed inside the casing will be paid for under the pay item sewer or water main in addition to this item.

6. Abandonment

- A. Description: The Contract Unit Price on this item includes everything necessary to abandon the structure or facility as described in the contract.

- B. Method of Measurement & Basis of Payment: This item will be paid for at the Contract Unit Price per pile set for the actual number placed and incorporated into the finished work.

7. Dewatering [Ref. Sec. 1.02 (4.D)]

- A. Description: The Contract Unit Price on this item includes the furnishing, installation, operation and removal of all materials and equipment to lower the groundwater level adjacent to the construction area to expedite the excavation for and installation of the work.

PAY ITEMS (DIVISION 7)

7.02 **SPECIFIC PAY ITEMS**

1-19 GENERAL

7. Dewatering (Cont'd.) [Ref. Sec. 1.02 (4.D)]

- B. Method of Measurement & Basis of Payment: This item will be paid for at the Contract Unit Price per lineal foot of excavation actually dewatered or as lump sum. Measurement will be along the centerline of the pipeline.

8. Special Structure

- A. Description: The Contract Unit Price on this item includes the furnishing and installation of labor and materials to complete the structure as shown on the plans, including excavation, backfilling, access openings and covers, floor drains and associated piping, pre-cast concrete sections, poured-in-place concrete, waterproofing, vent piping, removal of surplus excavated material and restoration of surface to within three inches of finished grade.
- B. Method of Measurement & Basis of Payment: This item will be paid for at the Contract Unit Price for each special structure as actually installed.

9. Pavement Removal

- A. Description: The Contract Unit Price on this item includes all labor, equipment, and material necessary to remove and dispose of existing concrete or asphalt as marked in the field by the Engineer and as described herein. The Contractor shall **SAWCUT** the existing pavement to the full depth to ensure clean and proper removal. Any additional sawcutting, removal, and replacement necessitated by damage caused by the Contractor shall be incidental.
- B. Method of Measurement & Basis of Payment: This item will be paid for at the Contract Unit Price as measured in the field.

10. Miscellaneous Items

- A. Description: This item includes the complete labor, equipment, and materials for constructing and/or placing in service a bid item not found elsewhere in this division.
- B. Method of Measurement & Basis of Payment: This item will be paid for at the Contract Unit Price.

20-29 SANITARY

20. Sewer Mains

- A. Description: The Contract Unit Price on this item includes clearing the work site of all trees, brush, structures and other objects which interfere with the placement of the sewer under construction, all excavation, the furnishing and placing of sewer pipe complete including wyes or tees, bedding material, backfilling, removal of surplus excavated material, testing, concrete work, protection and replacement or repair of existing utilities, and restoration of the surface to within three inches of original grade or to bottom of pavement base course. All work shall be done in accordance with the plans and specifications.

20. Sewer Mains

- B. Method of Measurement & Basis of Payment: The length of sewers to be paid for at the Contract Unit Price will be determined by measurement along the centerline of the various diameters, classes and depths of pipe as actually furnished and installed. Diameters, classes and depths shall be as shown on the proposal. Measurements shall be from center to center of adjacent manholes with no deduction for manhole diameter. Depth shall be determined by measuring the distance from sewer invert to existing grade at each manhole plus at a point midway between manholes; the average of the three measurements shall be the average depth of the sewer.

PAY ITEMS (DIVISION 7)

7.02 SPECIFIC PAY ITEMS

20-29 SANITARY (Cont'd.)

21. Manholes

- A. Description: The Contract Unit Price on this item includes all excavation, the furnishing and placing of precast sections and cast iron frame and cover, concrete work, drop pipes, connection of existing and new pipes, backfilling, removal of surplus excavated material, and restoration of surface to within three inches of original grade. All work shall be in accordance with the plans and specifications.
- B. Method of Measurement & Basis of Payment: This item will be paid for at the Contract Unit Price per manhole for the various depths as actually installed. The depth shall be determined by measuring the distance from sewer invert to top of casting.

22. Sewer Services

- A. Description: The Contract Unit Price on this item includes all the work and materials (excepting wyes and tees but including necessary bends) as described in sewer main above.
- B. Method of Measurement & Basis of Payment: The length of sewers to be paid for at the Contract Unit Price will be determined by measurement along the centerline of the pipe including risers as actually furnished and installed. Measurement shall be from end of tee or wye to end of service.

23. Bypass Pumping

- A. Description: The Contract Unit Price on this item includes everything necessary to provide bypass pumping sufficient to complete the contract work.
- B. Method of Measurement & Basis of Payment: This item will be paid for at the Contract Unit Price.

30-39 WATER

30. Ductile Iron Water Mains

- A. Description: The Contract Unit Price on this item includes clearing the work site of all trees, brush, structures and other objects which interfere with the placement of the water main under construction, all excavation, the furnishing and placing of water main testing, concrete work, disinfecting, backfilling and the removal of surplus excavated material, protection and replacement or repair of existing utilities, and restoration of the surface to within three inches of original grade or to bottom of pavement base course. All work shall be done in accordance with the plans and/or specifications.
- B. Method of Measurement & Basis of Payment: The length of water mains will be paid for on a lineal foot basis for pipe measured along the centerline of the various diameters and classes of pipe actually furnished and installed. There will be no deductions for fitting lengths. Unit price includes all labor and materials and related work described above.

31. Water Main Fittings

- A. Description: The contract unit price includes the furnishing and installation of the fittings delineated in the proposal.
- B. Method of Measurement & Basis of Payment: Fittings will be paid for at the Contract Unit Price for each piece successfully installed, complete with restraints, thrust block, and required appurtenances.

7.02 SPECIFIC PAY ITEMS

30-39 WATER (Cont'd.)

32. Water Valves and Boxes

- A. Description: The Contract Unit Price on this item includes the furnishing and installation of valves and valve boxes. All work shall be done in accordance with the Plans and/or Specifications and result in an operating valve.
- B. Method of Measurement & Basis of Payment: This work will be paid for at the Contract Unit Price per valve specified by size of valve on the proposal, which price includes all labor, materials, and related work as described above.

33. Fire Hydrants

- A. Description: The Contract Unit Price on this item will consist of furnishing and installing fire hydrants. It shall also include the furnishing and installation of the tee, auxiliary valve, valve box, connecting piping, thrust block, drainage pit, and miscellaneous appurtenances. All work shall be done in accordance with the plans and/or specifications and result in an operating hydrant.
- B. Method of Measurement & Basis of Payment: Fire hydrants will be paid for at the Contract Unit Price per complete Fire Hydrant assembly, which payment includes the furnishing and placing of all materials, the labor, and all related work necessary to complete the work as described above.

34. Live Tap

- A. Description: The Contract Unit Price on this item will consist of furnishing and installing tapping sleeves and valves on existing mains without loss of pressure in the existing main. It shall also include the installation of a valve box and a thrust block. All work shall be done in accordance with the plans and/or specifications.
- B. Method of Measurement & Basis of Payment: This work will be paid for at the Contract Unit Price per live tap as specified on the proposal, which price includes all labor, materials, and related work as described above.

35. Water Services

- A. Description: The Contract Unit Price on this item includes the furnishing and installation of corporation stops, curb stops, curb boxes and service pipe in accordance with the plans and or specifications. Work includes all excavation, backfill, furnishing and replacement of sand backfill, tapping of main, and removal of surplus excavated material. Long side service leads includes crossing of roads. Short side service leads are those which do not cross roads.
- B. Method of Measurement & Basis of Payment: This item will be paid for at the Contract Unit Price for each service lead completely installed.

40-49 PAVEMENT

40. Concrete Sidewalk

- A. Description: The Contract Unit Price on this item includes furnishing all labor, equipment, and materials required in connection with forming, placing, and curing of the concrete sidewalk to the lines and grade shown on the plans or as directed. All work shall be done in accordance with the plans and specifications.

7.02 SPECIFIC PAY ITEMS

40-49 PAVEMENT

40. Concrete Sidewalk (Cont'd.)

- B. Method of Measurement: Concrete sidewalk will be measured and paid for in square feet, determined by multiplying the actual length as measured along the centerline of the surface of the pathway, by the actual width. The area of fillets and odd shaped sidewalk will be computed separately. Deductions will be made for structures, crossroads, sidewalk ramps, and other discontinuities in the sidewalk. Sidewalk ramps and other appurtenances included in the contract as pay items will be paid for separately.

41. Sidewalk Ramps

- A. Description: Sidewalk Ramps consist of several different pay items, the combination of which include all labor, equipment, and material necessary to construct an ADA compliant curb ramp, in accordance with MDOT Special Detail R-28. The ramp pay items are depicted below in **7.04 RAMP PAY ITEMS**. All work shall be done in accordance with the plans and specifications.
- B. Method of Measurement & Basis of Payment: The ramp components will be measured and paid for at each Contract Unit Price.

42. Bituminous Construction

- A. Description: The Contract Unit Price on this item includes all labor, equipment, and material necessary for the construction of a bituminous surface, on a prepared foundation, at the specified application rate. If the bituminous mixture is not specified, the type used shall meet the approval of the Engineer. Construction methods shall conform to the latest edition of the MDOT Standard Specifications for Construction (SSC). All work shall be done in accordance with the plans and specifications.
- B. Method of Measurement & Basis of Payment: This item will be paid for at the Contract Unit Price as verified at the site through load tickets from the supplier or by field measurements.

43. Embankment

- A. Description: The Contract Unit Price on this item includes all labor, equipment, and materials required in connection with delivery and placement of granular embankment material. Embankment includes areas requiring fill as called for on the plans and the 3" of base for concrete sidewalk. All work shall be done in accordance with the plans and specifications. Granular material as noted shall mean Class II material per the MDOT 2020 SSC, Section 902.
- B. Method of Measurement & Basis of Payment: Embankment material shall be as measured in the vehicle transporting the material to the site. Load tickets from the supplier are required to verify the delivered amount.

44. Aggregate Base or Surface Course

- A. Description: The Contract Unit Price for this item includes all labor, equipment, and materials required in connection with the delivery and placement of the material. This work includes the required shaping, grading, and compacting of the material for the foundation of the asphalt ramps and driveway approaches.

The material shall be 21AA or 22A aggregate per the MDOT 2020 SSC, Section 902, unless otherwise specified. All work shall be done in accordance with the plans and specifications.

PAY ITEMS (DIVISION 7)

- B. Method of Measurement & Basis of Payment: Aggregate Surface Course shall be as measured in the vehicle transporting the material to the site. Load tickets from the supplier are required to verify the delivered amount.

7.02 **SPECIFIC PAY ITEMS**

40-49 PAVEMENT (Cont'd.)

45. Curb and Gutter

- A. Description: The Contract Unit Price on this item includes furnishing all labor, equipment, and materials required for forming, placing, and curing of the concrete curb and gutter to the line and grade as shown on the plans, including excavation, backfill, reinforcing steel, removal of existing curb and gutter, and all joints and joint materials. All work shall be done in accordance with the plans and specifications.
- B. Method of Measurement & Basis of Payment: The length of curb and gutter to be paid for at the Contract Unit Price will be determined by measurement along the face of the curb as actually installed, with no deductions in length for catch basins, inlet castings or gutters through concrete driveway openings.

46. Subgrade Preparation

- A. Description: The work of subgrade preparation includes furnishing all labor, equipment, and material necessary for clearing and grubbing, including all tree and bush removal, tree trimming, topsoil stripping, grading to shape the earth to develop the typical cross section shown on the plans, and any additional excavation required to construct the pavement to the grade shown on the plans.
- B. Method of Measurement & Basis of Payment: This item will be paid on a basis of lineal feet of pathway for work completed according to the specifications.

50-59 LANDSCAPE

50. Retaining Wall

- A. Description: The Contract Unit Price for this item includes all labor, equipment, and materials required in connection with the construction of a retaining wall, as shown on the plans. All work shall be done in accordance with the plans and specifications.
- B. Method of Measurement & Basis of Payment: Retaining walls will be measured by the square foot of the exposed face, above the pathway/sidewalk.

51. Fence

- A. Description: The Contract Unit Price for this item includes all labor, equipment, and materials required in connection with the construction of a fence, as shown on the plans. All work shall be done in accordance with the plans and specifications.
- B. Method of Measurement & Basis of Payment: The fence will be measured along the centerline of the fence, from centerline to centerline of the end posts.

52. Ditching

- A. Description: The Contract Unit Price on this item includes all excavation, and grading to develop the cross sections such that upon completion of site restoration the final grade shall be within plus or minus 0.1 foot of the required lines and grade. This item will also include clearing the work site of all trees, brush, structures and other objects which interfere with the performance of the work. All work shall be done in accordance with the plans and specifications. Final restoration will be paid for separately.

PAY ITEMS (DIVISION 7)

- B. Method of Measurement & Basis of Payment: This item will be paid for at the Contract Unit Price when the required cross section has been obtained. Measurement will be made along the centerline of the ditch. Payment for any final trimming of the subgrade required prior to site restoration is included in this pay item.

7.02 **SPECIFIC PAY ITEMS**

50-59 LANDSCAPE (Cont'd.)

53. Erosion Control

- A. Description: The Contract Unit Price on these items includes all labor, equipment, and material necessary to install and maintain the specified erosion control device(s).
- B. Method of Measurement & Basis of Payment: This item will be paid for at the Contract Unit Price for each erosion control item used.

54. Site Restoration

- A. Description: The Contract Unit Price on this item includes restoration of the ground surface to at least its preconstruction state. Specific examples are final grading of the top three inches of ground surface, furnishing and installation of seed and mulch, driveway and parking area repair, culvert replacement, sidewalk repair, replacement of signs, mailboxes, and fences, plus all other miscellaneous work associated with the complete restoration of the project site. The slope between new sidewalks and a lawn shall not exceed 1:3. All work shall be done in accordance with the plans and specifications.
- B. Method of Measurement & Basis of Payment: This item will be paid for at the Contract Unit Price when the complete project site has been restored to its original condition.

55. Drainage Pipe

- A. Description: The Contract Unit Price on these items includes all labor, equipment, and material necessary to install drainage pipe of the type and size specified, as shown on the plans.
- B. Method of Measurement & Basis of Payment: This item will be paid for at the Contract Unit Price for the length installed, as measured along the ground surface.

GATE VALVE REPLACEMENT 2025

SPECIAL PROVISIONS

These Special Provisions are in addition to those in the General and Technical Specifications, and supersede the General and Technical Specifications in the event of a conflict.

GENERAL

TESTING – The Contractor will be responsible for scheduling concrete and compaction testing. Testing will be done by Soil and Materials Engineers, Inc. (SME), (517) 887-9181. The cost will be paid by Meridian Township, except for any wait time. Compaction testing will be required for all backfill within the road zone-of-influence.

PROPERTY IRONS – A licensed surveyor shall reestablish property irons in the proper location, if disturbed. Buried property irons shall be extended using ½" diameter rods. The Contractor shall pay for reestablishment.

ROAD RIGHT-OF-WAY – All work in the public right-of-way is done under permit and approval of the Michigan Department of Transportation (MDOT), and Ingham County Road Department (ICRD). Meridian Township will secure the necessary MDOT permit.

BACKFILL – Backfilling shall be in accordance with ICRD and MDOT specifications, including compacted Class II granular material within the road zone of influence, and 12 inches of compacted 21AA aggregate below the pavement surface. The contractor may use the Township's materials, located at the Service Center, 2100 Gaylord C. Smith Ct., Haslett, MI 48840. The contractor is responsible for loading and transporting the material. Backfilling is incidental to this contract.

DEWATERING – All dewatering costs involved with this project will be incidental to the work. If dewatering is required it shall be pre-approved by the township engineer.

SHORING – Any shoring necessary to protect existing utilities or structures is incidental.

SITE CLEANUP – At the end of each day the work site shall be rough graded. In the event that it is necessary to leave a point of excavation open overnight, the area shall be safely barricaded. At the end of each week, or as deemed necessary by the Township, the street surface shall be wetted and swept clean of all construction debris.

JOINT RESTRAINT – All mechanical fittings shall be restrained using MEGALUG® style restraints or approved equal.

WATER MAINS – The depths of existing water mains will typically be 5~7 feet between the ground surface and crown of the pipes.

NOTES:

- *All water main shutdowns shall be coordinated with Meridian Township personnel. All shutdowns shall be timed to minimize the impact to water customers, including by utilizing overnight work.*
- *The pay items detailed in this contract are intended to provide for the complete scope of work as depicted on the plans. Any and all work not covered under a specific pay item, but necessary to complete the project, is considered incidental.*

PAY ITEMS

1a&b. TRAFFIC CONTROL – These pay items include all labor, equipment, and material necessary to provide and maintain traffic control as described herein, in accordance with the Michigan Manual of Uniform Traffic Control Devices, MDOT, and ICRD (if applicable) permit requirements.

All necessary traffic control devices are included. All barrels remaining in the road overnight must be lighted. See Appendix A for general traffic control details.

9a&b. PAVT, REM, _____ – These pay items include all labor, equipment, and material necessary to remove and dispose of existing concrete or asphalt pavement as marked in the field by the Engineer and as described herein. The Contractor shall **sawcut** the existing pavement to ensure clean and proper removal. The pavement shall be sawcut to the full thickness. Sawcutting is incidental to the removal and replacement process. Any additional removal, necessitated by damage caused by the Contractor, is incidental. *Dust masks must be used during all sawcutting activity.*

31a. WATER MAIN, 16 INCH, LINE STOP – This pay item includes all labor, equipment, and material necessary to install and maintain a device which is designed and constructed to stop the flow of water through the main to allow the installation of three (3) new 16-inch gate valves. The construction area shall be isolated and shut off using a temporary shut-off method such as a line stop or an alternative Township approved method. Contractor shall coordinate with property owners to minimize disruptions to water supply during constructions. Shutdowns are to be limited to 12 hours, or temporary water services must be supplied. Note: Additional utilities may be present in the work area and will be identified by Miss Dig prior to construction.

31b. WATER, SLEEVE, 16 INCH– This pay item includes all labor, equipment, and material necessary to install the specified sleeve as shown on the plans and as described in *Technical Specification 3*.

31c. WATER MAIN, 20 INCH, LINE STOP – This pay item includes all labor, equipment, and material necessary to install and maintain a device which is designed and constructed to stop the flow of water through the main to allow the installation of one (1) new 20-inch gate valve. The construction area shall be isolated and shut off using a temporary shut-off method such as a line stop or an alternative Township approved method. Contractor shall coordinate with property owners to minimize disruptions to water supply during constructions. Shutdowns are to be limited to 12 hours, or temporary water services must be supplied. Note: Additional utilities may be present in the work area and will be identified by Miss Dig prior to construction.

31d. WATER, SLEEVE, 20 INCH– This pay item includes all labor, equipment, and material necessary to install the specified sleeve as shown on the plans and as described in *Technical Specification 3*.

32a. WATER, GATE VALVE, 16 INCH (Installation) – This pay item includes all labor, equipment, and material necessary to install an EJIW FlowMaster® series gate valve with an EJIW screw-type valve box. This includes any and all watermain pipe necessary for installation of the valve. The Township will supply the 16" gate valves, valve boxes, and MEGALUG fittings.

32b. WATER, GATE VALVE, 20 INCH (Installation) – This pay item includes all labor, equipment, and material necessary to install an EJIW FlowMaster® series gate valve with an EJIW screw-type valve box. This includes any and all watermain pipe necessary for installation of the valve. The Township will supply the 20" gate valve, valve box, and MEGALUG fittings.

32c. WATER, GATE VALVE, 8 INCH (EXPOSURE) – This pay item includes all labor, equipment, and material necessary to expose an existing 8" gate valve located within the driveway at 1830 Grand River Avenue, Okemos, MI 48864. This item shall be completed after the installation of the in-line 16" valve to the west. Contractor shall ensure access to utilize the driveway at this location is maintained throughout construction.

32d. WATER, GATE VALVE, 8 INCH (REPAIR ALLOWANCE) – This pay item includes all labor, equipment, and material necessary to repair an existing 8" gate valve located within the driveway at 1830 Grand River Avenue, Okemos, MI 48864. The repair scope will be determined after valve

exposure as the valve type and exact repair parts are not known. An allowance of \$3,000 will be provided for this pay item. Payments for the repair exceeding the allowance amount will be paid for in accordance with "GC.11: CHANGES IN WORK/PAYMENT ADJUSTMENTS".

32e. WATER, INSERTION VALVE, 16 INCH (Installation) - This pay item includes all labor, equipment, and material necessary to install a Hydro-Stop [Insta-Valve](#) or similar insertion valve approved by the engineer.

32f. WATER, INSERTION VALVE, 20 INCH (Installation) - This pay item includes all labor, equipment, and material necessary to install a Hydro-Stop [Insta-Valve](#) or similar insertion valve approved by the engineer.

40a. CONCRETE, 4 INCH – This pay item includes all labor, equipment, and material necessary to install concrete of the specified depth in accordance with Division 4 and the Pathway/Sidewalk Detail Sheet. This work includes joining the proposed concrete to the existing concrete as shown in the Concrete Pinning Detail on the Detail Sheet.

40b. CONCRETE, 7 INCH – This pay item includes all labor, equipment, and material necessary to install concrete of the specified depth in accordance with Division 4 and the Pathway/Sidewalk Detail Sheet. This work includes joining the proposed concrete to the existing concrete as shown in the Concrete Pinning Detail on the Detail Sheet.

42. HMA, 13A – This pay item includes all labor, equipment, and material necessary to replace asphalt pavement necessitated by the gate valve installation. All pavements shall meet the existing material depth or the following minimum depths, whichever is greater: asphalt roadway, five (5) inches; commercial asphalt driveway, four (4) inches. The pavement on Park Lake Road is expected to be seven to eight (7-8) inches thick.

45a&b. CURB & GUTTER, REMOVE/REPLACE – These pay items include all labor, equipment, and material necessary to remove and replace curb and gutter. New curb and gutter shall be tied to the existing with 18 inch, #4 epoxy coated dowels drilled 9 inches into the adjacent curb in accordance with ICRD requirements.

HMA, 13A shall be used to repair any damage to the roadway caused by the contractor. Asphalt shall be used to repair the road only; asphalt shall not extend onto adjacent curb, gutter, or ramps, unless directed by the Engineer. Damaged asphalt shall be sawcut in order to provide a proper surface for the asphalt repair. All such asphalt repair work shall be considered incidental.

53a. EROSION CONTROL, SILT FENCE – This pay item includes all labor, equipment, and material necessary to install and maintain silt fence in accordance with Section 208 of the MDOT 2020 SSC. Final retainage will not be released until all SESC measures have been successfully removed.

53b. EROSION CONTROL, INLET PROTECTION, FABRIC DROP – This pay item includes all labor, equipment, and material necessary to install and maintain a device which is designed and constructed for use in the specified structure. Catch basin sediment guards shall be installed prior to construction, cleaned and maintained in a working state for the duration of the project, and removed and disposed of upon final completion and restoration of the construction site. Grass shall be growing before the sediment guards are removed, and retainage will not be released until the sediment guards are fully removed.

54. SITE RESTORATION – This pay item includes all labor, equipment, and material necessary to restore disturbed grass areas in accordance with the MDOT 2020 Standard Specifications for Construction (SSC), Section 816, and as described herein. The disturbed areas shall be restored to grade with three (3) inches of screened topsoil. For slopes less than 1:4, hydroseeding may be utilized with fertilizer, loose mulch, and a spray-applied tackifier. For slopes greater than 1:4, mulch blankets must be used.

All soil within the road zone of influence shall be restored and compacted to the specifications of both MDOT and the Township.

DISTANCE BETWEEN TRAFFIC SIGNS, "D"

"D" DISTANCES	POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA)										
	25	30	35	40	45	50	55	60	65	70	75
D (FEET)	250	300	350	400	450	500	550	600	650	700	750

GUIDELINES FOR LENGTH OF LONGITUDINAL BUFFER SPACE, "B"

"B" LENGTHS	SPEED*, MPH (PRIOR TO WORK AREA)											
	20	25	30	35	40	45	50	55	60	65	70	75
B (FEET)	33	50	83	132	181	230	279	329	411	476	542	625

* POSTED SPEED, OFF-PEAK 85TH PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED.

MINIMUM MERGING TAPER LENGTH, "L" (FEET)

OFFSET (FEET)	POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA)										
	25	30	35	40	45	50	55	60	65	70	75
1	11	15	21	27	45	50	55	60	65	70	75
2	21	30	41	54	90	100	110	120	130	140	150
3	32	45	62	80	135	150	165	180	195	210	225
4	42	60	82	107	180	200	220	240	260	280	300
5	53	75	103	134	225	250	275	300	325	350	375
6	63	90	123	160	270	300	330	360	390	420	450
7	73	105	143	187	315	350	385	420	455	490	525
8	84	120	164	214	360	400	440	480	520	560	600
9	94	135	184	240	405	450	495	540	585	630	675
10	105	150	205	267	450	500	550	600	650	700	750
11	115	165	225	294	495	550	605	660	715	770	825
12	125	180	245	320	540	600	660	720	780	840	900
13	136	195	266	347	585	650	715	780	845	910	975
14	146	210	286	374	630	700	770	840	910	980	1050
15	157	225	307	400	675	750	825	900	975	1050	1125

NOT TO SCALE

 Michigan Department of Transportation	NOT TO SCALE	MAINTAINING TRAFFIC TYPICAL		"B", "D" AND "L" TABLES CHANNELIZING DEVICE SPACING, SIGN BORDER KEY, AND ROLL-AHEAD SPACING	DATE: MAY 2021
		NO: 101-GEN-SPACING-CHARTS			SHEET: 1 OF 3
FILE: 101-GEN-SPACING-CHARTS.dgn					

FILE: 101-GEN-SPACING-CHARTS.dgn

THE FORMULAS FOR THE MINIMUM LENGTH OF A MERGING TAPER IN DERIVING THE "L" VALUES SHOWN IN THE ABOVE TABLES ARE AS FOLLOWS:

$$"L" = \frac{W \times S^2}{60} \quad \text{WHERE POSTED SPEED PRIOR TO THE WORK AREA IS 40 MPH OR LESS}$$

$$"L" = W \times S \quad \text{WHERE POSTED SPEED PRIOR TO THE WORK AREA IS 45 MPH OR GREATER}$$

L = MINIMUM LENGTH OF MERGING TAPER
S = POSTED SPEED LIMIT IN MPH PRIOR TO WORK AREA
W = WIDTH OF OFFSET

TYPES OF TAPERS

UPSTREAM TAPERS

MERGING TAPER
SHIFTING TAPER
SHOULDER TAPER
2 TO 1 LANE ROAD TAPER

TAPER LENGTH

L - MINIMUM
1/2 L - MINIMUM
1/3 L - MINIMUM
100' - MAXIMUM

DOWNSTREAM TAPERS

(USE IS RECOMMENDED)

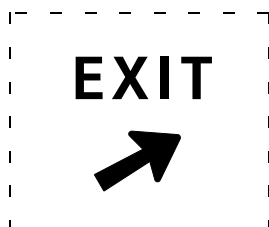
100' (PER LANE)

MAXIMUM SPACING FOR CHANNELIZING DEVICES

WORK ZONE SPEED LIMIT	DAY AND NIGHT 42" DEVICE SPACING (FT)		NIGHTTIME 42" DEVICE SPACING (FT)	
	TAPER	TANGENT	TAPER	TANGENT
< 45 MPH	1 x SPEED LIMIT	2 x SPEED LIMIT	25 FEET	50 FEET
≥ 45 MPH	50 FEET	100 FEET	25 FEET	50 FEET

SIGN OUTLINE KEY

DASHED OUTLINES INDICATE A SIGN THAT EXISTS ON SITE, AND NEEDS TO BE COVERED.



SOLID OUTLINES INDICATE A SIGN THAT IS TO BE PLACED ON THE PROJECT



NOT TO SCALE



NOT TO SCALE

MAINTAINING TRAFFIC TYPICAL

NO: 101-GEN-
SPACING-CHARTS

FILE: 101-GEN-SPACING-CHARTS.dgn

"B", "D" AND "L" TABLES
CHANNELIZING DEVICE SPACING
SIGN BORDER KEY AND ROLL-AHEAD SPACING

DATE: MAY 2021

SHEET:

2 OF 3

THE FOLLOWING NOTES APPLY IF CALLED FOR ON THE TRAFFIC TYPICAL

GENERAL NOTES

- G1: SEE GEN-SPACING-CHARTS FOR COMMON VALUES INCLUDING:
D = DISTANCE BETWEEN TRAFFIC CONTROL DEVICES
L = MINIMUM LENGTH OF TAPER
B = LENGTH OF LONGITUDINAL BUFFER
ROLL AHEAD DISTANCE
- G2: DISTANCE BETWEEN SIGNS, "D", THE VALUES FOR WHICH ARE SHOWN IN TYPICAL GEN-KEY ARE APPROXIMATE AND MAY NEED ADJUSTING AS DIRECTED BY THE ENGINEER.
- G3: ALL TEMPORARY SIGNS, TYPE III BARRICADES, THEIR SUPPORT SYSTEMS AND LIGHTING MUST MEET NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM REPORT 350 (NCHRP 350) TEST LEVEL 3, OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) TL-3 AS WELL AS THE CURRENT EDITION OF THE MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, THE CURRENT EDITION OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE STANDARD PLANS AND APPLICABLE SPECIAL PROVISIONS. ONLY DESIGNS AND MATERIALS APPROVED BY MDOT WILL BE ALLOWED.
- G4: DO NOT STORE EQUIPMENT, MATERIALS OR PERFORM WORK IN ESTABLISHED BUFFER AREAS.
- G5: ALL EXISTING PAVEMENT MARKINGS WHICH ARE IN CONFLICT WITH EITHER PROPOSED CHANGES IN TRAFFIC PATTERNS OR PROPOSED TEMPORARY TRAFFIC MARKINGS SHALL BE REMOVED BEFORE ANY CHANGE IS MADE IN THE TRAFFIC PATTERN. EXCEPTION WILL BE MADE FOR TRAFFIC PATTERNS FOR WORK LESS THAN THREE DAYS THAT ARE ADEQUATELY DELINEATED BY OTHER TRAFFIC CONTROL DEVICES.

SIGN NOTES

- S1: ALL NON-APPLICABLE SIGNING WITHIN THE CIA MUST BE MODIFIED TO FIT CONDITIONS, COVERED, OR REMOVED. FOR GUIDANCE SEE THE WORK ZONE SAFETY AND MOBILITY MANUAL, SECTIONS 6.01.09 AND 6.01.10.
- S2: R5-18b SIGNS ARE ONLY REQUIRED ON FREEWAY PROJECTS WITH A DURATION OF 15 DAYS OR LONGER OR NON-FREEWAY PROJECTS WITH A DURATION OF 90 DAYS OR LONGER. TO APPLY THIS TYPICAL WITHOUT R5-18b SIGNS, REMOVE THE SIGNS AND CONSOLIDATE THE SEQUENCE AS APPROPRIATE.
- S3: R5-18c IS ONLY REQUIRED IN THE INITIAL SIGNING SEQUENCE IN THE WORK ZONE. OMIT THIS SIGN IN SUBSEQUENT SEQUENCES IN THE SAME WORK ZONE.
- S4: ADDITIONAL SIGNING AND/OR ELONGATED SIGNING SEQUENCES SHOULD BE USED WHEN TRAFFIC VOLUMES ARE SIGNIFICANT ENOUGH TO CREATE BACKUPS BEYOND THE W20-5 SIGNS.
- S5: PLACE ADDITIONAL SPEED LIMIT SIGNS REFLECTING THE WORK ZONE SPEED AFTER EACH MAJOR CROSSROAD THAT INTERSECTS THE WORK ZONE, OR AFTER EACH ENTRANCE RAMP THAT COMES ONTO THE FREEWAY WHERE THE REDUCED SPEED IS IN EFFECT. PLACE ADDITIONAL SPEED LIMIT SIGNS AT INTERVALS ALONG THE ROADWAY SUCH THAT NO SPEED LIMIT SIGNS ARE MORE THAN 2 MILES APART. WHEN REDUCED SPEED LIMITS ARE UTILIZED IN THE WORK AREA, PLACE ADDITIONAL SPEED LIMIT SIGNS RETURNING TRAFFIC TO ITS NORMAL SPEED BEYOND THE LIMITS OF THE WORK AREA AS INDICATED. IF PERMANENT SIGNS DISPLAYING THE CORRECT SPEED LIMIT ARE POSTED, OMIT ALL W3-5b AND R2-1 SIGNS AND REDUCE SPACING ACCORDINGLY.
- S6: FABRICATE SPECIAL SIGNS IN ACCORDANCE WITH CURRENT SIGNING DESIGN STANDARDS.
- S7: PLACE ADDITIONAL R8-3 SIGNS AT A MAXIMUM 500' SPACING THROUGHOUT THE WORK ZONE.
- S8: WHEN SPEED LIMIT SIGNS CANNOT BE PLACED SIDE BY SIDE AS SHOWN, PLACE THEM "D" DISTANCE APART.
- S9: STOP SIGNS NOT REQUIRED IF SIGNALS ARE ON 4-WAY FLASHING RED. STOP AHEAD SIGNS ARE NOT REQUIRED IF THERE IS ADEQUATE VISIBILITY OF THE STOP SIGN OR IF SIGNALS ARE BEING USED TO CONTROL TRAFFIC.
- S10: PLACE REDUCED SPEED ZONE AHEAD SIGN (W3-5b) HERE WHEN USING A SPEED REDUCTION IN THIS DIRECTION.
- S11: THE NUMBER OF W1-6 SHIFT SIGNS TO PLACE FOR A SHIFT IS AS FOLLOWS:
SHIFTS 4FT OR LESS, PLACE ONE W1-6(R)(L)
SHIFTS 5FT TO 12FT, PLACE TWO W1-6(R)(L)
SHIFTS MORE THAN 12FT, PLACE THREE OR MORE W1-6(R)(L) SIGNS DEPENDING UPON LENGTH OF SHIFT AND AS PER THE ENGINEER.
- S12: PLACE R2-1 SIGNS AS DETAILED IN NOTE S5 WHEN THERE IS A SPEED REDUCTION IN THIS DIRECTION

TRAFFIC REGULATOR NOTES

- TR1: TRAFFIC REGULATORS MUST FOLLOW ALL THE REQUIREMENTS IN THE STANDARD SPECIFICATIONS, THE STANDARD PLANS AND APPLICABLE SPECIAL PROVISIONS, THE CURRENT VERSIONS OF THE TRAFFIC REGULATOR'S INSTRUCTION MANUAL AND THE VIDEO "HOW TO SAFELY REGULATE TRAFFIC IN MICHIGAN". THE MAXIMUM DISTANCE BETWEEN THE TRAFFIC REGULATORS IS DETERMINED BY THE ROADWAY ADT, GEOMETRICS, AND AS DIRECTED BY THE ENGINEER.
- TR2: PROVIDE APPROPRIATE BALLOON LIGHTING TO SUFFICIENTLY ILLUMINATE TRAFFIC REGULATOR'S STATIONS WHEN TRAFFIC REGULATING IS ALLOWED DURING THE HOURS OF DARKNESS.

TEMPORARY TRAFFIC CONTROL DEVICE NOTES

- TCD1: THE MAXIMUM DISTANCE IN FEET BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD NOT EXCEED 1.0 TIMES THE WORK ZONE SPEED LIMIT IN MPH FOR ROADWAYS WITH A POSTED WORK ZONE SPEED LIMIT LESS THAN 45 MPH AND SHOULD NOT EXCEED 50 FEET ON ROADWAYS WITH A POSTED WORK ZONE SPEED LIMIT OF 45 MPH OR GREATER. THE SPACING FOR 42 INCH CHANNELIZING DEVICE TAPERS ARE NOT TO EXCEED 25 FEET AT NIGHT.
- TCD2: THE MAXIMUM DISTANCE IN FEET BETWEEN CHANNELIZING DEVICES IN A TANGENT SHOULD NOT EXCEED TWICE THE WORK ZONE SPEED LIMIT IN MPH FOR ROADWAYS WITH A POSTED WORK ZONE SPEED LIMIT LESS THAN 45 MPH AND SHOULD NOT EXCEED 100 FEET ON ROADWAYS WITH A POSTED WORK ZONE SPEED LIMIT OF 45 MPH OR GREATER. THE SPACING FOR 42 INCH CHANNELIZING DEVICE TANGENTS ARE NOT TO EXCEED 50 FEET AT NIGHT.
- TCD3: TYPE III BARRICADES MUST BE LIGHTED FOR OVERNIGHT CLOSURES.
- TCD4: WHEN THE HAUL ROAD IS NOT IN USE, PLACE LIGHTED TYPE III BARRICADES WITH "ROAD CLOSED" EXTENDING COMPLETELY ACROSS THE HAUL ROAD.
- TCD5: USE VERTICAL PANELS IN LIEU OF THE TYPE B HIGH INTENSITY LIGHT SHOWN IN THE STANDARD PLAN FOR TEMPORARY CONCRETE BARRIER (R-53, AND R-126) WHEN USED WITH A TEMPORARY SIGNAL SYSTEM.
- TCD6: PLACE LIGHTED ARROW PANELS AS CLOSE TO THE BEGINNING OF TAPERS AS PRACTICAL, BUT NOT IN A MANNER THAT WILL OBSCURE OR CONFUSE APPROACHING MOTORISTS WHEN PHYSICAL LIMITATIONS RESTRICT PLACEMENT. IN CURBED SECTIONS, IF ARROW BOARD CANNOT BE PLACED BEHIND CURB, PLACE ARROW BOARD IN THE CLOSED LANE AS CLOSE TO THE BEGINNING OF TAPER AS POSSIBLE.
- TCD7: ADDITIONAL TYPE III BARRICADES MAY BE REQUIRED TO COMPLETELY CLOSE OFF ROAD FROM EDGE OF PAVEMENT TO EDGE OF PAVEMENT.
- TCD8: WHERE THE SHIFTED SECTION IS SHORTER THAN 600 FEET, A DOUBLE REVERSE CURVE SIGN (W24-1) CAN BE USED INSTEAD OF THE FIRST REVERSE CURVE SIGN, AND THE SECOND REVERSE CURVE SIGN CAN BE OMITTED.
- TCD9: RUMBLE STRIPS ARE TO BE PLACED AS SPECIFIED IN THE CONTRACT. IF NOT SPECIFIED IN THE CONTRACT, PLACE RUMBLE STRIPS AS SHOWN, AND IN ACCORDANCE WITH THE RUMBLE STRIP MANUFACTURER'S RECOMMENDATIONS. AN ARRAY OF RUMBLE STRIPS CONTAINS THREE RUMBLE STRIPS. PLACE THE RUMBLE STRIPS IN THE ARRAY AT A CONSISTENT DISTANCE, BETWEEN 10' AND 20' APART.
- TCD10: SEE THE WORK ZONE SAFETY AND MOBILITY MANUAL, PORTABLE CHANGEABLE MESSAGE SIGN GUIDELINES FOR RECOMMENDED AND CORRECT PCMS MESSAGING. STAGGER PCMS THAT ARE ON OPPOSING SIDES OF THE ROAD 1000 FEET FROM EACH OTHER.

RAMP NOTES

- RMP1: WHEN CONDITIONS ALLOW, E5-1 SIGNS MUST BE REMOVED OR COVERED AND CHANNELIZING DEVICES MUST BE POSITIONED TO ENABLE RAMP TRAFFIC TO DIVERGE IN A FREE MANNER
- RMP2: STOP AND YIELD CONDITIONS SHOULD BE AVOIDED WHENEVER PRACTICAL. WHEN CONDITIONS WARRANT, R1-1 SIGNS MAY BE USED IN PLACE OF R1-2 SIGNS. WHEN R-1 SIGNS ARE USED, W3-1 SIGNS MUST BE USED IN PLACE OF W3-2 SIGNS. CONSIDERATION SHOULD BE GIVEN TO CLOSING THE RAMP TO COMPLETE WORK TO ALLOW AN ADEQUATE MERGE DISTANCE. WORK SHOULD BE EXPEDITED TO AVOID THE STOP AND/OR YIELD CONDITIONS.

 Michigan Department of Transportation	NOT TO SCALE	MAINTAINING TRAFFIC TYPICAL		TRAFFIC TYPICALS NOTE SHEET	DATE: MAY 2021
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KEY

- ... CHANNELIZING DEVICES
- ⚡ LIGHTED ARROW PANEL
- ← TRAFFIC FLOW
- REFLECTS EXISTING SPEED LIMIT
- * ONLY REQUIRED FOR INTERMEDIATE-TERM STATIONARY AND LONG-TERM STATIONARY

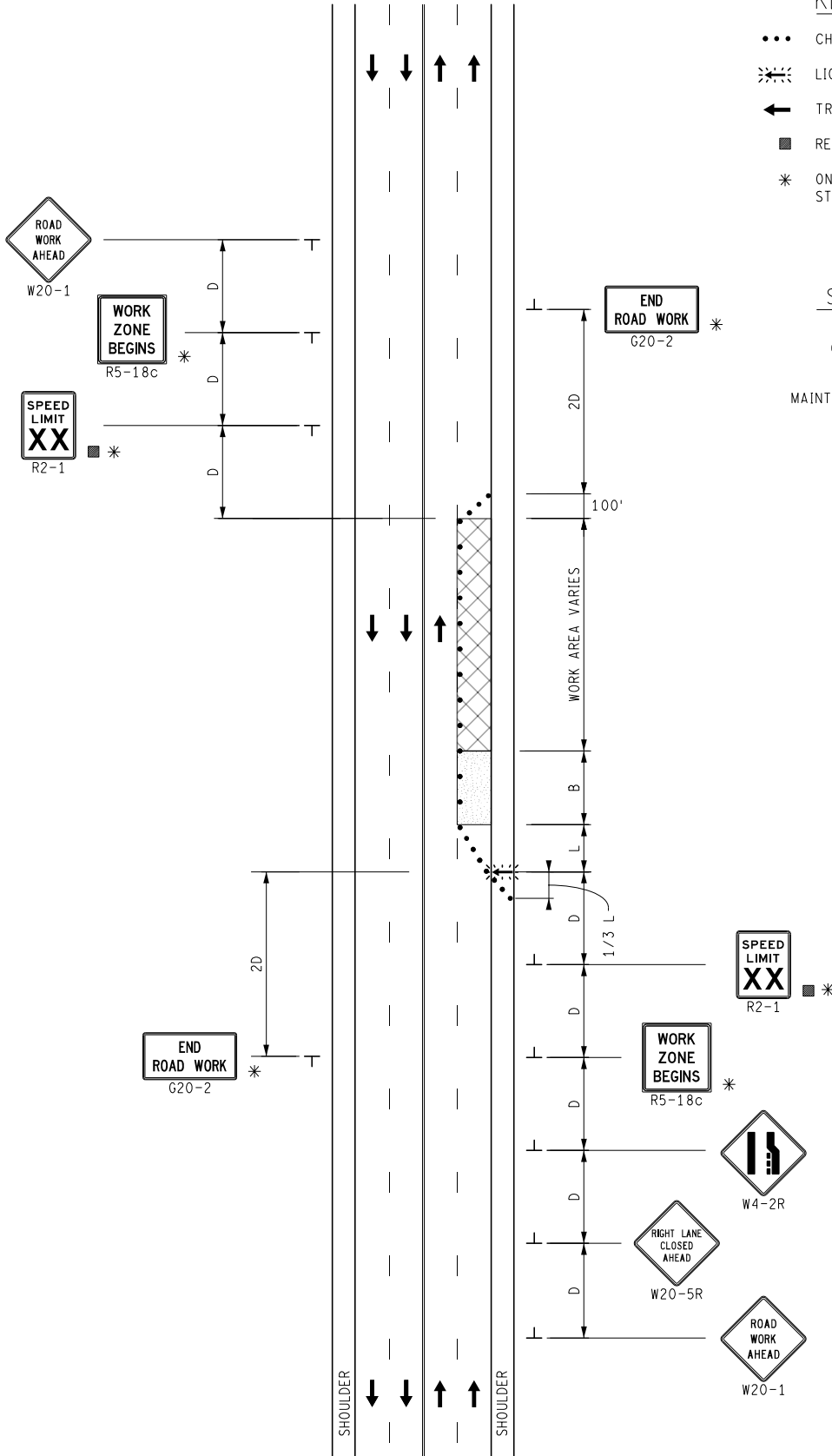
STANDARD NOTES

(SEE 102-GEN-NOTES)

GENERAL: G1, G2, G3, G4

SIGNING: S1, S3

DEVICES: TCD1, TCD2, TCD6
MAINT & SURV MS2, MS3, MS4



NOT TO SCALE

 Michigan Department of Transportation	MAINTENANCE MAINTAINING TRAFFIC TYPICAL	DURATION: LONG-TERM STATIONARY INTERMEDIATE-TERM STATIONARY SHORT-TERM STATIONARY	RIGHT LANE CLOSURE ON AN UNDIVIDED MULTI-LANE ROADWAY, NO SPEED REDUCTION	DATE: MAY 2021
				NO: 4123A- M-NFW-1LC-(R)
				SHEET: 1 OF 1

FILE: 4123A-M-NFW-1LC-(R).dgn

Notes for Figure 6H-22—Typical Application 22
Right Lane Closure on Far Side of Intersection

Guidance:

1. If the work space extends across a crosswalk, the crosswalk should be closed using the information and devices shown in Figure 6H-29.

Option:

2. The normal procedure is to close on the near side of the intersection any lane that is not carried through the intersection. However, when this results in the closure of a right lane having significant right turning movements, then the right lane may be restricted to right turns only, as shown. This procedure increases the through capacity by eliminating right turns from the open through lane.
3. For intersection approaches reduced to a single lane, left-turning movements may be prohibited to maintain capacity for through vehicular traffic.
4. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
5. Where the turning radius is large, it may be possible to create a right-turn island using channelizing devices or pavement markings.

Figure 6H-22. Right Lane Closure on Far Side of Intersection (TA-22)