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1. GENERAL

These Specifications form a part of the Contract herewith attached and are intended to technically describe the nature of the materials, equipment and workmanship required to complete in a workmanlike manner, the sanitary sewer and appurtenances shown on the accompanying plans.

The Specifications herein set forth are intended to cover the prominent phases of construction and to insure the establishment of first-class material installed in a first-class manner. To safeguard the interests of the Owner, the Contractor will take all measures not specifically enumerated herein, but which conform to good practice to secure a first-class result. To further safeguard the Owner, all essentials of good practice in the hiring, working and protecting the construction and the protection of individuals and property, enumerated herein or not shall be followed.

Methods of construction will generally be left to the discretion of the Contractor as long as satisfactory progress is made and good workmanship is produced.

All work in this Contract shall conform to the 2012 Michigan Department of Transportation Standard Specifications for Construction, except as modified in these Specifications.

2. SPECIFICATIONS

Unless otherwise noted, the use of the terms Standard Specification (000.00) or Article (000.00) refers to the 2012 Michigan Department of Transportation (MDOT) Standard Specifications for Construction.

3. SCOPE OF THE WORK

The work under this Contract includes all work required to replace, rehabilitate, or install and put into service the sanitary sewer, and work related items at the designated locations as shown on the Plans and in the Specifications. The Scope also includes complete restoration of all areas related to the construction. Included in this Contract is the installation of sanitary sewer in a steel casing by open cut construction across the Clinton River. This portion of the construction may only be performed outside of the spawning period which takes place between March 1st and June 30th. Separately, the project related construction within the Diegel property (Parcel ID 07-01-451-002) must be completed prior to March 15th.

4. CONTRACT TIME

The Contractor shall complete, in an approved manner, all of the work contracted for in the time stated in the Agreement.

5. PROGRESS CLAUSE

Work shall start within 14 days of notice to proceed by the Township of Shelby, or on the date indicated as the starting date on the approved Progress Schedule for work to be performed.

Work Restrictions

Allowable work hours will be controlled by Local Ordinances (7 AM to 7 PM). Work hours may be extended, within reason and to establish or remove traffic control measures as specified herein. No work shall be performed on Sundays and Holidays, unless special permission is granted by the Township of Shelby.

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Progress Limitations

The Contractor shall have the concrete and HMA restoration work completed within 2 weeks of the completion (testing and acceptance by sewer section) of the sanitary sewer work which disturbed the concrete or HMA pavement per the approved construction phase plan. It is also expected that all restoration associated with the sewer construction along 25 Mile Road will be completed prior to or while the construction of the cross country reach of the sewer is proceeding.

The Low Bidder(s) for the work covered by this Proposal will be required to meet with the Engineer and Township of Shelby for a preconstruction conference. The scheduled date for this preconstruction conference will be set after the Contract is awarded, the Public Hearing on Cost has been held, and the completion of Resolutions 3-5 by the Shelby Township Board of Trustees.

The named Subcontractor(s), as listed in the Bid Form, is recommended to be at the preconstruction conference if such items materially affect the work schedule.

The Project Engineer and the Township of Shelby will arrange the time and place for the preconstruction conference.

Prior to the preconstruction conference, the Contractor shall submit to the Engineer for review a preliminary Progress Schedule including a construction phase plan.

The Progress Schedule shall include, as a minimum, the controlling work items for the completion of the project and the planned dates that these work items will be controlling operations (I.e. Clinton River Crossing, Diegel Property, etc.). The final project completion date shall also be included in the Project Schedule. If the bidding documents specify other controlling dates, these shall also be included in the Progress Schedule.

6. CONSTRUCTION MILESTONES

The project shall be substantially completed within four hundred twenty (420) calendar days from the date that the Contract times commence. The project shall be completed in its entirety including site restoration, clean-up, and punch-list work within four hundred eighty (480) calendar days from the date that the Contract times commence. It is required that the construction at the Clinton River crossing be completed outside of the spawning period which takes place between March 1st and June 30th.

Separately, the project related construction within the Diegel property (Parcel ID 07-01-451-002) must be completed prior to March 15, 2018.

7. TRUCK ROUTES

All construction traffic shall comply with existing traffic patterns and regulations. All trucks shall have loads trimmed to prevent spillage. The Contractor is responsible to obtain approval for haul routes/roads from all agencies with jurisdiction. The Contractor shall be responsible for the repair or replacement of any property or road which is damaged due to truck and equipment traffic. Construction traffic should utilize major roads at all times.

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8. TEMPORARY SHEET PILING

This item of work shall include all labor, material, and equipment necessary to furnish and install the steel sheet piling as necessary to dewater the work site and/or to protect the existing buildings, roads, and structures adjacent to the work. The cost to provide, install, and remove the temporary sheet piling shall be considered included in the cost to construct the sewer or related work items.

9. WORKING SPACE

In his operations, the Contractor shall interfere as little as possible with traffic, comply with MCDR requirements and in all cases shall confine his operations within the Right-Of-Way lines, easement lines and project limits.

Stockpiling of construction material and equipment will be permitted as necessary, but in no case shall traveled ways, driveways, or entrances be unduly obstructed.

Should the Contractor desire additional space on private property, he may obtain such space on privately owned property at his own expense, by written agreement with the owner thereof (which shall be provided to the Engineer prior to the use of the private property), and shall pay for all restoration costs.

10. UTILITY COORDINATION

Determining the existence and location of underground and overhead utilities and their protection shall be the responsibility of the Contractor. The Contractor shall call MISS DIG (811). No guarantee is made by the Owner or Engineer as to the completeness and/or accuracy of utility information shown on the plans. Information is from available records and is approximate only.

The Contractor shall cooperate with and coordinate construction activities with the Owners of utilities as stated in Section 104.08 of the 2012 MDOT Standard Specifications for Construction. In addition, for the protection of underground utilities, the Contractor shall follow the requirements in Section 107.12 of the 2012 MDOT Standard Specifications for Construction. Contractor delay claims, resulting from a utility, will be determined based upon Section 108.09 of the 2012 MDOT Standard Specifications for Construction.

The following utilities have facilities located within the Right-of-Way and Easements:

Electric	Detroit Edison (DTE Electric) James Hammond, Supervisor 15600 Nineteen Mile Road Clinton Twp., MI 48038 (Location closing prior to December 31, 2017) james.hammond@dteenergy.com	(586) 412-4758
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Electric Trans	International Transmission Company (ITC) Steven J. Cooper Real Estate Manager – Michigan ITC Holdings 27175 Energy Way,	(248) 946-3298 Direct: (248) 946-3767
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Novi, MI 48377
scooper01@itctransco.com

Gas	Consumers Energy Jeff Parol 35350 Kelly Road Clinton Township, MI 48035 jparol@cmsenergy.com	(586) 307-3276
Gas	Consumers Energy Transmission Pipeline Engineering Kevin Couturier, Third Party Engineering Technical Analyst 3201 E Court Street, Flint, MI 48506 kevin.couturier@cmsenergy.com	(989) 574-7538 (mobile)
Cable	WideOpenWest John Hajec, Construction Engineer 37150 Plymouth Road Livonia, MI 48150 John.Hajec@wowinc.com	(586) 883-7257
Telephone	AT & T Ken Dandron, Engineer 100 South Main Street, Room 314 Mount Clemens, MI 48043 kd7928@att.com	(734) 237-4319
Water and Sewer	David G. Miller II, Director Shelby Township DPW 6333 23 Mile Road Shelby Township, MI 48316	(586) 731-5990

For protection of underground utilities and in conformance with Public Act 53, the Contractor shall dial 1-800-482-7171 or 811 a minimum of three full working days, excluding Saturdays, Sundays, and holidays prior to beginning each excavation in areas where public utilities have not been previously located. Members will thus be routinely notified. This does not relieve the Contractor of the responsibility of notifying utility Owners who may not be a part of the "Miss Dig" alert system.

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The Owners of Public Utilities will not be required by the Township to move additional poles or structures in order to facilitate the operation of construction equipment unless it is determined by the Engineer that such poles or structures constitute a hazard to the public or are extraordinarily dangerous to the Contractor's operation.

The structure and utility information shown on the plans indicate approximate locations and type of facilities as disclosed by the various utility company records. No guarantee is given or implied to the completeness or accuracy thereof.

It shall be the Contractor's responsibility to pre-locate and determine the exact depth of existing utilities and building services prior to construction. Said utility information shall be supplied to the Owner, Engineer, and/or utility companies involved.

The above list is provided for the Contractor's use and may not be a complete listing. The Contractor shall coordinate his work with other utilities/contractors that are performing the work on these items or any other project work being performed in the work area. There will be no compensation for delays in construction due to the failure of the Contractor to properly coordinate conflicts with utility companies.

11. OWNER/UTILITY CONTRACT COORDINATION

The Charter Township of Shelby will enter into separate contracts with:

- DTE Energy to relocate existing utility poles, as shown on the drawings that are within the project work area.
- In the event a private well system is impacted or damaged by the Contractor's work, the residential well repair, or abandonment and reinstallation will be completed by a contractor that the Township will hire under a separate contract. **Note: the Contractor's operations and dewatering plan specifically shall take existing wells into consideration and include appropriate protective measures.**
- In the event residential septic tank/ field is impacted or damaged by the Contractor's work within the project permanent easements, the Contractor shall provide a connection to the sewer according to "Sewer Tap, 6 inch and Abandon Septic Tank" and shall be compensated according to the Contract Unit Price. If a septic system is damaged outside of project permanent easements, the Contractor shall provide a connection to the sewer according to "Sewer Tap, 6 inch and Abandon Septic Tank" and shall not be compensated.

The above list is provided for the Contractor's use and may not be a complete listing. The Contractor shall coordinate his work with other Contractors that are performing the work on these items or any other project work being performed in the work area.

All work required to coordinate and work around projects shall be included in the work items for which the construction is being performed. The Contractor shall have no reason for claims due to delays required to accommodate these projects and coordination.

12. SEWER TAP, 6 INCH AND ABANDON SEPTIC TANK

The existing septic fields are shown on the plans based on best available information at the time of plan preparation. Prior to construction, the Contractor shall contact the private property owners of the septic systems potentially impacted by the construction to determine actual locations and field verify. Subsequent to field verification, the septic tank and/or field location shall be delineated with construction fencing (“snow fence”) or other approved means.

Where the installation of a sanitary lead connection and disconnection from an existing front yard septic tank and field is required during the sanitary sewer construction, this item of work shall include the installation of the necessary fittings to tie the existing effluent line from the building into the new sanitary lead, and abandonment and filling of the septic tank in accordance with Macomb County Health Department (MCHD) requirements. If the existing septic tank is encountered within the excavation for the sanitary sewer, the Contractor shall remove and dispose of the septic tank. This item of work shall also apply where existing septic systems noted or not noted on the plans are impacted by the construction.

Materials for this item of work shall be in accordance with Section 203 of the MDOT 2012 Standard Specifications for Construction, and as modified herein. These include the requirements of the Sanitary Sewer Specifications and those shown on the Sanitary Sewer Standard Detail Sheets.

This construction shall include all labor, materials, equipment for the work and shall be performed in conformance with the Sanitary Sewer Specifications and shown on the Sanitary Sewer Standard Detail Sheet. Further the work shall be performed in accordance with Section 203 of the MDOT 2012 Standard Specifications for Construction and MCHD Environmental Health Services Division requirements.

“Sewer Tap, 6 Inch and Abandon Septic Tank” shall be paid for at the Contract Unit Price for each Sewer Tap and Septic Tank Abandonment for tanks or fields located with the project permanent easements, or completed with no compensation for tanks or fields located outside of the project permanent easements.

13. SEPTIC TANK / FIELD REPAIR

The existing septic fields are shown on the plans based on best available information at the time of plan preparation. Prior to construction, the Contractor shall contact the private property owners of the septic systems potentially impacted by the construction to determine actual locations and field verify. Subsequent to field verification, the septic tank and/or field location shall be delineated with construction fencing (“snow fence”) or other approved means. Contractor shall be responsible for any damages caused by moving construction-related equipment over septic field or tank. When any existing septic field/tank is damaged during the construction of the sanitary sewer, the Contractor shall be responsible for installation of “Sewer Tap, 6 inch and abandon Septic Tank” as noted in that section. When any existing septic lead from the house to the septic tank, or from the tank to the field is damaged during the construction of the sanitary sewer, the Contractor shall be responsible for notifying the Macomb County Health Department (MCHD) Environmental Health Services Division and coordinating with their representative to provide a field determination of the required repairs. The Contractor will

repair the damaged lead as necessary to put the system back into service as determined by MCHD and for their required approval.

Materials for this item of work shall be in accordance with Section 203 of the MDOT 2012 Standard Specifications for Construction, and as modified herein and MCHD requirements. These include the material and construction requirements of the Sanitary Sewer Specifications. The Contractor shall support and protect existing septic systems to minimize the impact of construction on systems intended to be left in place.

This construction shall include all labor, materials, equipment for the work and shall be performed in conformance with the Sanitary Sewer Specifications. Further the work shall be performed in accordance with Section 203 of the Standard Specifications and MCHD requirements.

The cost of "Septic Lead Repair" shall be included in the unit prices bid for the work.

14. WELL, RESIDENTIAL, ABANDON OR RELOCATE

The Contractor shall support, monitor and protect existing water well systems including crock wells / shallow wells to minimize the impact of construction and dewatering on systems intended to be left in place. Refer to the dewatering specification for monitoring the well system.

Where the existing potable water well system is impacted by the sanitary sewer construction, the contractor shall notify the Township immediately. This shall also apply where existing well systems not noted on the plans are impacted by the construction.

All work and/or costs required to coordinate the work with the Township shall be included in the cost of the work being performed. The Contractor shall have no reason for claims due to delays required to accommodate this work, monitoring and coordination.

In the event a private well system is impacted or damaged by the Contractor's work, the work to repair, or abandon and reinstall well will be completed by a contractor that the Township will hire under a separate contract.

15. PROJECT UTILITY SOURCES

All work in connection with public and/or private utilities required in the execution of the contract shall be the responsibility of the Contractor.

Public Utilities shall include, but shall not necessarily be limited to: storm drainage facilities, sewerage systems, and water (supply, transmission and/or distribution) systems, and other utilities under the jurisdiction of a governmental unit.

Private Utilities shall include, but shall not necessarily be limited to: all utilities under the jurisdiction of the Michigan Public Service Commission.

The location of existing public and/or private utilities shown on the plans is in accordance with the best

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information available. No guarantee is given that the locations are absolutely accurate or that utilities other than those shown are not present. The Contractor shall, in any event, protect or have relocated all utilities that might interfere with construction.

In the event existing utilities are encountered along the line of the work, the Contractor shall perform his operations in such a manner that utility services will not be interrupted and shall, at his own expense, make all temporary provisions to maintain such utility service.

Any work on public utilities, such as removal and replacement thereof (including chlorination and pressure testing of water mains) shall be done only with the agency or department in charge of the utility being fully informed 48 hours in advance of the work and having an inspector on the site during the work. Opening and/or closing of gate valves shall be performed by the Township DPW.

Whenever, in the opinion of the Engineer, utilities need not be removed or relocated, but can be maintained or secured without interfering with the proper execution of the work, such maintenance shall be performed by the Contractor or shall be arranged for by the Contractor with the utilities concerned. The work shall be accomplished at the Contractor's expense in such a manner as to secure the safety of the utility involved and the work under construction.

If the Contractor neglects to restore or repair damaged or injured public or private utilities or structures, the Owner may, upon recommendation by the Engineer and upon 48 hours written notice to the Contractor, proceed to restore or make good such damage or injury and deduct the cost thereof from any monies that are, or may become, due the Contractor for the work under this contract.

All costs in connection with the above work, including inspection by the municipality and/or other authority (public or private) having jurisdiction, shall be considered as included in the contract price except as otherwise provided herein.

16. UTILITY PROTECTION

Determining the existence and the locations of underground and overhead lines and their protection shall be the responsibility of the Contractor. Utility work referring to the removal, relocation and/or replacement of gas, telephone, and electric power lines, pipes, poles and appurtenances as required, will be done by the forces of the utility company involved. Allowances in the bid for related costs of that work shall be made by the Contractor. CALL MISS DIG. Special consideration shall be given to locating, by hand digging, gas mains and gas services.

Before starting construction, the Contractor shall check with the Utility Companies to ascertain for himself the location of all utilities which might interfere with the work and shall give due notice to all organizations whose utilities will be affected by his operations.

Additionally, private services may exist within the areas impacted by this work. It shall be the Contractor's responsibility to contact property owners and determine potential service conflicts. During the project construction the Contractor shall protect and support all utilities, utility and lighting poles that are encountered. All costs for location, verification, support and protection shall be included in the cost for

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the proposed pay item or item of work conflicting with the utility. The Contractor shall use extreme caution when operating near all overhead and/or buried utilities.

17. PERMITS

The Soil Erosion and Sedimentation Control Agency for this Project is the Macomb County Public Works Commissioner, Soil Erosion Division. The Contractor will be required to secure a Soil Erosion and Sedimentation Control Permit for this Project.

The Contractor will be required to secure a Macomb County Department of Roads (MCDR) Permit for this Project.

Permits from the Michigan Department of Environmental Quality (MDEQ) are required for the proposed sanitary sewer work and work within regulated wetlands, floodplain, river, and drain crossings. The Owner is applying for these permits.

Approval is required from the Macomb County Public Works Office Engineering Department and MDEQ for work within the Preston Drain and the Middle Branch of the Clinton River. The Contractor is responsible for any associated bonds, fees or insurance required to work within the County Drains.

The Contractor shall be responsible for securing all the necessary permits and paying all required Bond Fees, Construction Observation Fees, and/or miscellaneous permit fees for work to be performed under the Contract, whether mentioned herein or not. These costs shall be considered to have been included in the unit prices bid for the affected Contract Items (Pay Items) of work.

18. EXISTING WATER MAINS AND SEWERS

The Contractor will be responsible for any damage caused by the Contractor to existing water mains and sanitary and storm sewers and structure covers during the construction of all improvements on this Project.

Remove, support or relocate existing utilities and drains in the path of construction as shown on the Drawings and as specified or otherwise required.

Unless shown otherwise on the Contract Drawings, flow in existing utilities must be maintained by diversion, pumping, fluming, relocation, taking the utility out of service, when approved by the Authority having jurisdiction over the utility, or by other methods determined by the Contractor at no additional cost to the Owner.

Utilities removed for construction must be reinstalled to their original condition unless directed by the Engineer. The reinstallation is at no additional costs to the Owner, unless otherwise indicated on the Construction Drawings.

19. ACCESS TO DRIVEWAYS

The Contractor shall provide reasonable access to residential/ commercial driveways for the duration of the Project. This shall include maintaining at a minimum an aggregate surface (maintenance gravel)

subsequent to the sewer excavation and installation. Place maintenance gravel to provide a flush transition between shoulders, driveways and other areas for maintenance of traffic. The materials, construction and maintenance requirements shall be in accordance with Standard Specifications Section 306. If approved by the Engineer, the Contractor may leave maintenance gravel in place as part of the work. The required aggregate surface will be paid for as "Maintenance Gravel" per the contract unit price bid.

20. PRIVATE LAWN IRRIGATION SYSTEMS IN PUBLIC RIGHT-OF-WAY OR EASEMENT

The Contractor is advised that some properties may contain lawn sprinkler systems between the back-of-curb and property line. The Contractor shall be responsible for locating and protecting all private lawn irrigation systems within the public right-of-way or easements encountered during construction. All lawn irrigation systems which are damaged during the course of construction activities shall be repaired or replaced in kind. This work shall be included in other items of work and shall not be paid for separately.

21. STREET LIGHTING

All street lights and/or light posts shall be protected by the Contractor. Any damage to the lights and/or light poles or to the buried cables as a result of the Contractor's operations shall be repaired at no additional cost to the Project.

22. SANITARY FACILITIES

Necessary sanitary convenience for the use of workers on the site, properly secluded from public observation, shall be provided and maintained in a sanitary condition by the Contractor and included in the cost for "Mobilization". The use of sanitary facilities shall be strictly enforced.

23. BONDS, INSURANCE AND MOBILIZATION

This item of work shall consist of the costs of preparatory work and operations for the Project as outlined in Section 150 of the MDOT 2012 Standard Specifications for Construction including required bonds and insurance. Each Bidder shall enter, in the "Unit Price" column of the Proposal, his Lump Sum bid amount for this item, up to a maximum amount equal to three percent (3%) of the Total Base Bid.

24. SAWCUTTING

Sawcutting on this Project for the purpose of removing concrete or HMA pavements, walks, drives, etc. shall not be measured and paid for separately. If the materials are found to have not been sawcut to the full depth, the Contractor shall bear the expense of recutting a new joint, if necessary, as directed by the Engineer.

The completed work shall not be measured and paid for separately, but rather shall be included in the unit prices bid for Contract Items which require this work.

25. BACKFILL

When backfilling under or within a one-on-one slope line drawn downward and outward from a point three feet (3') outside the pavement, shoulder or curb and gutter and as shown on the plans. Backfill shall be with Granular Material Class II and compacted to ninety-five (95%) of the maximum unit weight to within twelve inches (12") of finish grade. The top twelve inches (12") shall be filled with 21AA limestone

so that after compacting to ninety-five percent (95%) of the maximum unit weight, it will have a thickness of twelve inches (12").

All labor, material, equipment, compaction, re-compaction, excavation and any related work or associated costs required to meet compaction requirements shall be incorporated in the unit price per foot of pipe; there will be no compensation for any work or material described herein or required to meet compaction requirements.

26. EXCESS EXCAVATION

All excess excavation material or spoils shall be removed from the site to a location provided by the Contractor. All excess excavation removal shall be included in the cost for the related contract work item.

27. EVALUATION OF SOIL CONDITIONS

Prior and subsequent to its bid, the Contractor shall have responsibility to review the soil report and site conditions and draw their own conclusions as to groundwater, soil and/or rock conditions to be encountered, and shall complete the work under any job or field condition which are ascertainable prior or after bidding and further shall complete the work under whatever conditions the Contractor may create due to the selected means, methods or sequencing of construction at no additional cost to the owner.

If the bidder, based upon its own judgment, is not capable of correctly evaluating the soils information available, then it is strongly recommended that the bidder employ or retain the services of a professional geotechnical consultant for such evaluation.

The geotechnical investigation report contained herein addresses conditions and problems which might be encountered throughout the project, including but not limited to the following: bottom heave, artesian or other hydraulic conditions, trench wall failures due to weak soils, etc. The Contractor shall have the responsibility for employing construction practices capable of controlling these situations. Excavated materials shall not be stockpiled within the influence of the excavation without adequate excavation support. Excavated materials shall be removed an adequate distance to eliminate the influence of said surcharge on the trench. **CONTRACTOR MUST STUDY THE SOILS REPORT (See Part III - Attachments).**

The Contractor shall submit his proposed construction procedures describing construction methods, sequence of construction and sheeting and bracing to be used to the engineer for review prior to proceeding with the work. All submittals by the Contractor shall be prepared and sealed by a professional engineer. The engineers review shall not relieve the Contractor from the contractor's responsibilities including maintaining a safe and stable excavation. Said review shall not be interpreted nor construed as creating within the engineer any obligation with respect to the means, methods, techniques, sequencing or safety of the project.

Bids submitted shall include labor, material, equipment, stone, other bedding and pipe support materials, geotextile fabric, trench undercut, sheeting, bracing, dewatering, additional geotechnical investigation and recommendations, and any related work necessary to provide a quality system in conformance with the line and grade shown on the plans. All work described herein shall be included in the pay item for which they are required.

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28. PROFESSIONAL GEOTECHNICAL CONSULTANT

The Contractor, or a qualified person in his employment shall be responsible to evaluate the compatibility of his proposed construction methods with the Plans, Specifications and Soil Information provided by the Owner for bidding and informational purposes. If the Bidder, based upon its own judgment, is not capable of correctly evaluating the soils information available, then it is strongly recommended that the bidder employ or retain the services of a professional geotechnical consultant for such evaluation. The Contractor, a qualified person in his employment, or the Professional Geotechnical Consultant shall attend a pre-construction meeting prior to the commencement of the work and if necessary, arrange for once per month job meetings to address any soils related problems which may develop during the course of the work.

The cost of the services of the Professional Geotechnical Consultant's services shall be borne by the Contractor and shall be included in the Unit Prices in the Contractor's Proposal.

29. TREE CLEARING

This item of work includes removing and disposing of trees, stumps and debris as identified on the drawings or as directed by the Township. Trees shall include existing living and dead trees, standing and fallen. This item of work also includes saving trees as identified on the drawings.

Materials provided for this item shall be in accordance with Section 201 of the MDOT 2012 Standard Specifications for Construction, and as modified herein.

Work will be performed in accordance with Section 201 of the MDOT 2012 Standard Specifications for Construction, and as modified herein. All tree removal locations will be identified in field by the Township. The limits of this pay item are identified on the plans. All stumps within the limits and outside of the identified wetlands shall be chipped or ground down to 4 inches below the proposed ground level. All stumps located within the wetland area shall be left flush with the ground elevation. The Contractor will be required to remove all dead and fallen trees as directed by the Township. The Contractor must dispose of all materials on a daily basis. Overnight stockpiling of logs and / or wood chips will not be permitted in/or near work areas by Contractors engaged in the clearing activities. The Contractor may not donate, sell or otherwise distribute wood to residents or businesses.

The completed work for clearing trees, stumps and debris will be measured and paid for at the contract unit price for "Tree Clearing" per Station measured along the centerline of the sewer installation. Quantities for "Tree Clearing" shall be measured along the sewer centerline and include both sides of the permanent easement for construction of the sewer and required structures.

The Contractor will receive no additional compensation for the tree clearing within the temporary construction easement. The Contractor shall make an estimation of the tree clearing within the temporary construction easement and include this cost as part of his cost per station. Individual trees called for removal outside of the wooded areas will be paid for as "Tree, Rem, __ Inch to __ Inch" or "Tree, Rem, 37 Inch or Larger".

30. ASH TREE DISPOSAL

Trees infested with the Emerald Ash Borer (EAB) shall be disposed of according to the Michigan Department of Agriculture and Rural Development guidelines. All sixty eight (68) counties in the Lower Peninsula are designated as Quarantine Level I. Any violation of the quarantine is subject to the full authority of Act No. 72, Public Acts of 1945, as amended and may be subject to fines and/or imprisonment. Trees tagged with an EAB tag shall be removed and the tag shall be sent to the MDOT Transportation Service Center, or other state agency which issued the permit. In the Lower Peninsula, it is not necessary to report EAB; however, if EAB is suspected and further confirmation is required, the Contractor shall contact a qualified arborist for consultation prior to disposal of the trees in question.

The Contractor is responsible for the proper disposal of all ash trees removed in conjunction with the construction. All ash trees so removed shall be disposed of at an approved facility. The nearest ash tree disposal facility is Mid-Michigan Recycling, located at 24935 Twenty-one Mile Road, Macomb Township, Michigan, 48042. The cost of disposing of ash trees at a disposal facility shall be included in the cost for "Tree Clearing", "Tree, Rem, __Inch to __Inch" or "Tree, Rem, 37 Inch or Larger".

31. DR STRUCTURE, REM

Where called for on the plans and necessary for the construction of the sanitary sewer and required connections to existing sewers, the Contractor will remove existing storm structures.

Materials for this item of work shall be in accordance with Section 203 of the MDOT 2012 Standard Specifications for Construction, and as modified herein and the requirements shown on the Storm Sewer Standard Detail Sheets.

Perform work in accordance with Section 203 of the MDOT 2012 Standard Specifications for Construction, and on the Storm Sewer Standard Detail Sheets.

"Dr Structure, Rem" shall be paid for at the Contract unit price for each sewer structure removed.

32. DEWATERING SYSTEM

Based on the subsurface conditions encountered and documented in the geotechnical investigation report, construction dewatering efforts will be required along much of the proposed alignment. The dewatering effect will require the use of a positive means of control, such as deep wells and/or well point dewatering wells installed at regular intervals along the alignment. The spacing, diameter, and the depth of the wells shall be designed by a qualified geotechnical engineer. The design will depend on the excavation depth, groundwater levels, extent of granular soils, and hydraulic conductivity of the dewatered soil, method of construction and necessary noise control for the required generators (i.e. silencers) and other dewatering system components. Additionally the design will take into account existing wells, ponds and lakes. The system shall not interrupt service from wells or lower lake levels of ponds and lakes. Greater conductivity and/or smaller aquifer thickness will result in lesser well spacing. Additionally, greater conductivity will result in a greater discharged volume of water.

Review of the Michigan Department of Environmental Quality (MDEQ) Wellogic system yielded

27 known residential wells in the general vicinity of the proposed project. It is common that many residential wells do not appear on the MDEQ Wellogic system. It should be expected that the actual number of wells in the project area may be double or more than those indicated. For the purpose of bidding, construction and dewatering system design, it should be assumed that any of these wells could be impacted by dewatering during construction. The Contractor shall include provisions to address the existing residential wells, any required monitoring and potential remedial measures including temporary water service in their dewatering system plan.

Given that the bottom of the granular soil layer is above the excavation bottom and underlain by very low permeability soils, the dewatering program should be designed to effectively lower the water level to the bottom of the granular soil layers, which is expected will require a significant number of wells. Even after such an effort, some seepage and flow should be expected from the layer, and the Contractor's temporary earth retention system should be designed to account for this. At locations where excavations will terminate within granular soils dewatering to at least two feet below the excavation base is required to maintain a stable base condition and to prevent a "quick" condition from developing.

This item of work will require the installation, maintenance of, and removal of a dewatering system as necessary for the installation of the sanitary sewers and related work items. Contractor shall provide a dewatering system plan to the Engineer and Owner for review and approval prior to commencing the construction work items requiring the dewatering system.

The materials for this item shall be in conformance with good industry standards, in conformance with the Dewatering Specifications and as presented in the approved dewatering plan. This item will include all labor, materials and equipment necessary to install, operate and maintain the system per the approved dewatering plan and as required to complete the sewer construction.

"Dewatering System" will be paid at the Contract unit lump sum price bid. Payment for this item will include all labor, materials and equipment necessary to install, operate and maintain the dewatering system. Progress payments for this item of work shall be determined by the percentage of the completed work based on the length of the installed sanitary sewer pipe.

33. SOIL EROSION AND SEDIMENTATION CONTROL

During progress of the work, the Contractor shall provide and maintain soil erosion and sedimentation control measures as provided in these specifications and accompanying drawings. In the absence of specific requirements the Contractor shall provide soil erosion and sedimentation control measures in accordance with Part 91 of Act 451 of the Public Acts of 1994, as amended and the Macomb County Public Works Commissioner(MCPWC).

Soil erosion measures required on the plans or by the Macomb County Public Works Commissioner, including but not limited to drain guards, silt fence, channel restoration / installation, construction dewatering system, Mulch Blanket (also called Rolled Erosion Control Products (RECP)) and bank stabilization shall be installed and maintained by the Contractor throughout the project. Soil erosion measures shall be constructed in conformance with details shown on Soil Erosion and Sedimentation Control Plan Sheet of these plans and the requirements of the MCPWC. All labor, materials, equipment,

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disposal of sediment, removal of sediments and any related maintenance work shall be included in the cost for "Soil Erosion and Sedimentation Control".

The completed work for Soil Erosion and Sedimentation Control (SESC) shall be paid for at the Contract lump sum price for "Soil Erosion and Sedimentation Control". Progress payments for this item of work shall be determined by the percentage of the completed work based on the length of the installed sanitary sewer pipe.

SESC Measures shall be measured and paid for as the lump sum specified above which shall be considered payment in full for all labor, materials, and equipment required to complete the work.

No additional payment shall be provided for either maintenance or removal of temporary erosion control items.

34. EROSION CONTROL, SEDIMENT TRAP

This item of work shall consist of furnishing, placing and maintaining the specified soil erosion control measure at each location shown on the plans and/or the SESC permit and within the construction influence area to positively prevent sediment and other construction generated debris from being carried downstream.

Materials provided for sediment traps shall be conforming to the details shown on Soil Erosion and Sedimentation Control Plan sheet of these plans.

Sediment traps shall be constructed conforming to the detail shown on Soil Erosion and Sedimentation Control Plan Sheet of these plans. The Contractor will be responsible for removal and disposal of sediments collected in basin and for periodic clean out of basins as required to maintain the cross-section shown on the detail.

"Erosion Control, Sediment Trap" of the type and number required will be included in the contract lump sum price for "Soil Erosion and Sedimentation Control".

35. EROSION CONTROL, INLET FILTER

This item of work shall consist of furnishing, placing and maintaining a specific soil erosion control measure at each existing and proposed catch basin structure located within the construction influence area to positively prevent sediment and other construction generated debris from entering adjacent sewers or drains.

The erosion control measure to be furnished, installed, and maintained under this item of work shall be as supplied by one of the following, or any approved equal:

Catch-All Inlet Protector
Marathon Materials, Inc.
25523 W. Schultz Street
Plainfield, IL 60544
(800) 983-9493

Siltsack
ACF Environmental
2831 Cardwell Road
Richmond, VA 23234

Dandy Sack
Mirafi
365 South Holland Drive
Pendergrass, GA 30567
(888) 795-0808

The Contractor shall construct and maintain the Inlet Filters in strict accordance with the detail shown on the plans.

"Erosion Control, Inlet Filter" of the type and number required will be included in the contract lump sum price for "Soil Erosion and Sedimentation Control".

36. MULCH BLANKET

This item of work is for the installation of the mulch blanket, also indicated as Rolled Erosion Control Product (RECP) as shown and as detailed on the plans. It includes all labor, materials, equipment, excavation and any related work necessary to perform this construction and as required by the Soil Erosion Control Permit and the Michigan Department of Environmental Quality (MDEQ) permit.

"Mulch Blanket" of the type and quantity required will be included in the contract lump sum price for "Soil Erosion and Sedimentation Control".

37. EROSION CONTROL, SILT FENCE

This item of work shall consist of furnishing, placing and maintaining the specific soil erosion control measure as shown on the Soil Erosion plan and located within the construction influence area to positively prevent sediment and other construction generated debris from entering adjacent sewers or drains.

The erosion control measure to be furnished, installed, and maintained under this item of work shall be as supplied by one of the following, or any approved equal:

Mirafi
365 South Holland Drive
Pendergrass, GA 30567
(888) 795-0808

The Contractor shall construct and maintain the silt fence in strict accordance with the details shown on WRC Soil Erosion and Sedimentation Control Details sheet of these plans.

"Erosion Control, Silt Fence" of the type and quantity required will be included in the contract lump sum price for "Soil Erosion and Sedimentation Control".

38. DUST CONTROL

The Contractor shall provide adequate measures to control dust caused by this operation. The methods employed, and frequency of application shall be as approved by the Inspector. Payment for "Dust Control" shall be included in the contract price for "Soil Erosion and Sedimentation Control", and not paid separately.

39. CLINTON RIVER CROSSING

The construction of the sanitary sewer requires the installation of a steel casing pipe by open cut construction across Clinton River. Clinton River is an important fishery, particularly for Brown Trout and all construction is required to be completed outside of the spawning period which takes place between March 1st and June 30th. An additional consideration for construction is the timeframe for the lowest potential water levels centered approximately in July.

There are very specific requirements for the construction within the creek crossing area. These include stockpiling of the creek bed material, bank stabilization and planting of native woody vegetation as called for in the permit. It is anticipated that the creek bed material will be layered with varied sizes of granular material. The upper material is anticipated to be smaller in size with larger rock or stone anticipated in the lower layers of the creek "sub-pave" material. Each of these materials if encountered shall be stockpiled separately from the other as well as other soil and aggregate materials during the construction of the sanitary sewer casing and related items. These materials will be used for backfill of the excavation within the creek crossing area. A minimum of 24" of the "sub-pave" material will be backfilled over the top of the casing to be topped with 12" of the smaller upper creek bottom material. In addition, permanent soil erosion control measures for tributary ditches and swales are to be installed as part of this work. Larger reclaimed natural stone from the excavation will be used as the permanent soil erosion control measures for the tributary ditch as shown on plan and profile. This construction will be performed in strict compliance with the Michigan Department of Environmental Quality permit and per these Construction Documents.

Payment for all labor, material, equipment, and work required for the construction of the Clinton River crossing shall be included in "Steel Casing Pipe, 36 Inch, Open Cut".

40. STEEL CASING PIPE, 36 INCH, OPEN CUT

This item of work is for the installation of the steel casing pipe by open cut construction across the Clinton River and as detailed on the plans. This work will occur across the flow channel of the Clinton River and the Contractor shall include provisions to control the flow in their bid. It shall include all labor, materials, equipment, excavation and any related work necessary to perform the open cut construction at this crossing and as required by the Michigan Department of Environmental Quality (MDEQ) permit.

Steel casing shall be as described in the Sanitary Sewer Specifications and on the Sanitary Sewer Standard Detail Sheet.

Steel casing pipe to be installed by open cut construction to be performed as described in the Sanitary Sewer Specifications and on the Sanitary Sewer Standard Detail Sheet. Materials of excavation shall include any and all materials encountered, such as, top soil, clay, sand, gravel cinders, boulders,

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heterogeneous fill material, old timbers, or any combination of these in whatever condition found. Pavement, curb, or sidewalk necessary to be cut shall be considered as excavation. Included in this pay item are all costs necessary to perform the open cut installation of the casing pipe and the installation of the associated sanitary sewer in the casing.

“Steel Casing Pipe, 36 Inch, Open Cut” shall be per lineal foot. The Contractor will receive no additional compensation for rocks, cobbles or boulders encountered. The Contractor shall make an estimation of the number to be encountered and include this cost as part of the cost per lineal foot. The Contractor shall include provisions in their bid to control and work within the flow of the Clinton River.

41. STEEL CASING PIPE, __ INCH, JACKED IN PLACE

This item of work is for the installation of the steel casing pipe by jacked in place construction as shown as detailed on the plans. It includes all labor, materials, equipment, excavation and any related work necessary to perform this construction or as required by the Michigan Department of Environmental Quality (MDEQ) permit or Consumers Energy.

Steel casing shall be as described in the Sanitary Sewer Specifications and on the Sanitary Sewer Standard Detail Sheet. The size of casing shall be as shown on the plans and bid in the Bid Proposal. If the Contractor elects to request increasing the casing size to perform the work they shall submit this request to the Engineer in writing. There will be no additional compensation for the Contractor-elected casing size increase.

Steel casing pipe to be installed by jacked in place construction is to be performed as described in the Sanitary Sewer Specifications and on the Sanitary Sewer Standard Detail Sheet. Materials of excavation shall include any and all materials encountered, such as, top soil, clay, sand, gravel cinders, rocks, cobbles, boulders, heterogeneous fill material, old timbers, or any combination of these in whatever condition found. Pavement, curb, or sidewalk necessary to be cut shall be considered as excavation. All boulders encountered shall be removed in accordance with work item **“REMOVAL OF 12-INCH TO 24-INCH DIAMETER BOULDERS FROM CASING”**.

Review of the Geotechnical Report shows that the N-values vary throughout the project area with many exceeding the 30-75 range. The Contractor shall review the report and soil borings and determine the methods and equipment necessary to bore and jack the casing under the conditions to be encountered.

“Steel Casing Pipe, __ Inch, Jacked in Place” shall be per lineal foot. The Contractor shall make an estimation of the number of rocks, cobbles or boulders under 12” diameter to be encountered and include this cost as part of the cost per lineal foot.

42. SANITARY SEWER, CL __ , __ INCH,

This item of work is for the installation of the sanitary sewer pipe as shown and as detailed on the plans. It include all labor, materials, equipment, excavation and any related work necessary to perform this construction and as required by the Michigan Department of Environmental Quality (MDEQ) permit.

Sanitary sewer shall be as described in the Sanitary Sewer Specifications and on the Sanitary Sewer

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Standard Detail Sheet and as modified herein. In addition to the Sanitary Sewer Specifications and the specifications provided on the Sanitary Sewer Standard Detail Sheets, the reinforced concrete pipe for Sanitary Sewer, CI-__, __Inch, shall include the following additives or admixtures in the approved mix to help resist microbial induced corrosion (MIC) of concrete pipe in sanitary sewers and/ or Alkali-Silica Reaction (ASR) :

Reinforced Concrete pipes and manholes shall be Portland Cement-Type II in combination with 30 percent replacement of the total cementitious weight with ground granulated blast-furnace slag with minimum grade of 100 and 3 percent Xypex admixture by weight of cementitious material or the equivalent Sika or BASF admixtures shall be added at the manufacturer's recommended dosage rate.. In addition, ConShield additive or equivalent shall be incorporated into the approved pre-cast concrete pipe at 1 gallon per cubic yard of concrete or per the manufacturer's recommendations.

Sanitary sewer to be installed by open cut construction to be performed as described in the Sanitary Sewer Specifications and on the Sanitary Sewer Standard Detail Sheet. Materials of excavation shall include any and all materials encountered, such as, top soil, clay, sand, gravel cinders, boulders, heterogeneous fill material, old timbers, or any combination of these in whatever condition found. Pavement, curb, or sidewalk necessary to be cut shall be considered as excavation. Any unforeseen obstacles such as buried trees or timbers, abandoned utilities, metal objects, concrete masses, or any debris encountered shall be removed as work included in the contract price for the construction of the sewer.

Due to the potential for adverse impact to existing septic systems, a phasing plan shall be prepared for putting sections of the new sewer into service prior to final completion of other sections.

The Contractor shall provide a phasing plan for the installation of the sanitary sewers prior to the start of construction. Due to the existence of homes and businesses along the route of the new sewers, it is recommended that after the completion of each half mile of the sewers the contractor shall test the sewer in accordance with Sanitary Sewer Specifications and the Sanitary Sewer Standard Detail Sheet. After the acceptance, the sewer shall be put in service and existing users can connect their wastewater services. The Contractor can submit their own phasing plan, based on their proposed operation for construction. If this plan is acceptable to the Township and its Engineers, the Contractor will receive written approval.

"Sanitary Sewer, CI-__, __Inch, " will be paid for at the contract unit price per lineal foot.

This item of work shall be paid for at the contract unit price per each and will include all labor, materials, and equipment required to perform the work.

43. MIRAFI 140N FILTER FABRIC

Where the plans call for lining of the trench with Mirafi 140N Filter Fabric the installation of "Filter Fabric Trench Liner" as detailed on the Sheet 4 of the Construction Plans. The trench liner shall be installed in accordance with the Standard Specifications, TenCate-Mirafi "INSTALLATION GUIDELINES FOR GEOTEXTILES USED IN FILTRATION AND DRAINAGE APPLICATIONS" and the manufacturer's recommendations.

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The materials for construction are described in the Sanitary Sewer Specifications and on the Sanitary Sewer Standard Detail Sheet and in accordance with Section 910 of the Standard Specifications.

This construction shall include all labor, materials, equipment for the work and shall be performed in conformance with the Sanitary Sewer Specifications, Standard Specifications and shown on the Sanitary Sewer Standard Detail Sheet.

“Mirafi 140N Filter Fabric” will be paid for at the contract unit price per linear foot of the constructed and lined sanitary sewer trench.

44. SANITARY SERVICE CONNECTION, PVC, 6 INCH

Where the plans call for the installation of sanitary leads as shown on the plans and tabulated on the plans as “Sanitary Sewer Lead Information”, the connection of the sanitary lead/riser to the sanitary sewer shall be with the required wye, saddle or lateral connector as appropriate for the sewer pipe and required by the Standard Sanitary Sewer Detail Sheets.

The materials for construction are described in the Sanitary Sewer Specifications and on the Sanitary Sewer Standard Detail Sheet.

This construction shall include all labor, materials, equipment for the work and shall be performed in conformance with the Sanitary Sewer Specifications, Standard Specifications and shown on the Sanitary Sewer Standard Detail Sheet.

“Sanitary Service Connection, PVC, 6 Inch” will be paid for at the contract unit price per each service connection constructed. The vertical height of the 6” PVC riser as shown on the plans as “Sanitary Sewer Lead Information” is included in the pay item per each “Sanitary Service Connection, PVC, 6 Inch”

45. SANITARY LEAD, 6 INCH, DIRECTIONAL DRILL

Where the plans call for the installation of sanitary leads under major roads and otherwise shown on the plans the sanitary leads will be installed by horizontal directional drilling.

The materials for construction are described in the Sanitary Sewer Specifications, Standard Specifications for Horizontal Directional Drilling and on the Sanitary Sewer Standard Detail Sheet.

This construction shall include all labor, materials, equipment for the work and shall be performed in conformance with the Sanitary Sewer Specifications, Standard Specifications for Horizontal Directional Drilling and shown on the Sanitary Sewer Standard Detail Sheet.

“Sanitary Lead, 6 Inch PVC, Directional Drill” will be paid for at the contract unit price per lineal foot.

46. CULVERT AND DITCH RESTORATION

Where improperly graded culverts or ditches are disturbed and must be restored, the Engineer may establish new grades to improve the drainage and the restoration shall conform to the new grades.

Restoration to new grades shall be included in "Surface Restoration, Hydroseeding".

47. SURFACE RESTORATION, HYDROSEEDING

This work consists of preparing all areas designated by the Engineer, and applying topsoil, fertilizer, seed, and mulch to those areas. All work shall be performed in accordance with Section 816 of the MDOT 2012 Standard Specifications for Construction, except as modified herein.

All materials used for the Surface Restoration shall meet the requirements of Section 917 of the MDOT 2012 Standard Specifications for Construction. Materials included in Surface Restoration, Hydroseeding are:

- i. Seed Mixture THM (Turf Loamy to Heavy) (917.12)
- ii. Fertilizer Chemical Nutrient Class A (917.10.B.1)
- iii. Recycled Newsprint Mulch (917.15.C.2)
- iv. Tackifier – Terra Tack #1 or equal
- v. Topsoil Surface, Furn, 4 inch (917.07) *(with exceptions noted below)
- vi. Water for Hydroseed Slurry (917.11)

All restoration areas shall be prepared and compacted per Section 816 of the MDOT 2012 Standard Specifications for Construction. With the exception of the cross-country reaches of the sanitary sewer (*Sheets 13 through 24 of the engineering plans), place topsoil to the minimum depth indicated above to meet finish grade. If the area being restored requires more than the minimum depth of topsoil to meet the finish grade, this additional depth must be filled using topsoil, or at the Contractor’s option, suitable embankment material may be used. Furnishing, placing and compacting this additional material is included in this item of work. Hydroseed slurry requires 24 hours to dry before rainfall or watering occurs to be effective.

The Contractor shall obtain water from a hydrant designated by the Township for filling water trucks. A fee may be required by the Township DPW.

- vii. Application Rate: The mixture shall be proportioned per 1,000 square feet of surface as follows:
 - 1. Water.....1000 gallons
 - 2. Seed.....5 pounds
 - 3. Chemical Fertilizer.....5.5 pounds
 - 4. Recycled Newsprint Mulch ...35 pounds
 - 5. Tackifier.....8 pounds

The Contractor shall perform Surface Restoration, Hydroseeding for those areas disturbed. All areas disturbed by the Contractor and/or his Subcontractor beyond the normal construction limits of this project shall be restored according to this special provision at the direction of the Engineer. Normal construction limits are defined as existing rights-of-way and permanent easements. These may be further limited by permit conditions such as allowable disturbed areas under the Michigan Department of Environmental Quality permits. No additional payment will be made for restoration beyond the normal

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construction limits. The Contractor shall estimate the required restoration of temporary easements or other areas outside the normal construction limits and include that cost in the related construction work item.

The pay item Surface Restoration, Hydroseeding shall include the necessary equipment, materials and labor to place the topsoil, and hydroseed mixture. Water will be applied per the requirements of Section 816.03.I and will be included in the unit cost for hydroseeding. Additional hydroseed applications may be required to cover weak spots. All follow up applications will not be paid for. "Surface Restoration, Hydroseeding" will be measured in place and paid at the contract unit price per square yard. Final acceptance of the project and Final Payment will not be issued until positive growth of all restored areas meets the Township's approval.

48. WETLANDS CROSSINGS

As part of the sanitary sewer construction requires open cut crossing small areas of existing wetland. Each wetland crossing will be backfilled with stockpiled excavation material with the top 12 inches of topsoil stockpiled separately and used to backfill the top portion of the trench. Native plant seed mixes will be used to re-vegetate.

As part of the construction, clay trench plugs will be placed at the location, width and depth shown per the plans and as required by the permit. The clay plugs will be compacted select clay fill material placed in 4 inch to 6 inch lifts after compaction. The clay material will be classified CL or CH according to the Unified Soil Classification System (USCS). Penetrating foot type compaction equipment shall be used to compact the clay fill and no rocks, stones, sticks or foreign objects greater than 2 inches will be allowed. The compaction equipment will have protrusions greater in length than the lift thickness of the clay being compacted. The lifts shall be compacted to the degree that no further appreciable consolidation is evident under the action of the compaction equipment. Compaction will be to 90 percent of the maximum dry density as determined by the Modified Proctor Test. The Contractor will maintain the required moisture content to achieve the required density including timely placement of the overburden material.

Wetland Q is scrub/shrub wetland located along the cross country alignment of the sanitary sewer. Wetland Q is a small wetland pocket created largely due to existing poor drainage along the sewer alignment and is located approximately between survey stations 230+70 and 231+50. During the proposed construction, the wetland impacts are expected to be limited and temporary and the area returned to preconstruction elevations. Payment for all labor, material, equipment, and work required for the construction crossing the wetlands shall be included in the related construction work item or "Wetland Restoration".

49. WETLANDS RESTORATION

This work consists of preparing all disturbed wetlands areas designated by the Engineer, and applying topsoil, fertilizer, seed, mulch and/or sod to those areas. All work shall be performed in accordance with Supplemental Specification Section 02930 and Section 816 of the MDOT 2012 Standard Specifications for Construction, except as modified herein and the Michigan Department of Environmental Quality (MDEQ) permit.

All materials used for the Wetlands Restoration shall meet the requirements of Section 917 of the MDOT 2012 Standard Specifications for Construction and as included in the Supplemental Specification Section 02930. The only location specifically requiring seeding as part of restoration is the crossing of Wetland Q. The recommended seed mix is the following:

Forested Wetland Seed Mix
Spence Restoration Nursery
2220 E. Fuson Road
Muncie, IN 47302
Phone: (765) 286-7154
Kevin@spencenursery.com
www.spencenursery.com

All work shall meet the requirements of the MDOT 2012 Standard Specifications for Construction and as included in the Supplemental Specification Section 02930. In addition, all work shall be performed in compliance with the Michigan Department of Environmental Quality Part 303 Permit.

“Wetlands Restoration” will be measured in place and paid at the contract unit price per square yard.

50. FENCE, MOVING

Where the plans call for the removal and resetting of existing fence encountered during the construction of the sanitary sewer, the fence will be reset as shown on the plans or as directed in field. All work shall be performed in accordance with Section 808 of the MDOT 2012 Standard Specifications for Construction, except as modified herein.

The materials for construction are described in the Section 907 and required in Section 808 of the MDOT 2012 Standard Specifications for Construction, except as modified herein.

This construction shall include all labor, materials, equipment for the work and shall be performed in conformance with Section 808 of the MDOT 2012 Standard Specifications for Construction, except as modified herein or as shown on the plans.

“Fence, Moving” will be paid for at the contract unit price per lineal foot.

51. TRAFFIC CONTROL AND MAINTENANCE

This work shall consist of all labor, materials, and equipment required to maintain traffic in accordance with this Special Provision.

Traffic shall be maintained by the Contractor throughout the project in accordance with Sections 104.07, 104.11 and 812 of the 2012 Michigan Department of Transportation's Standard Specifications for Construction, the 2011 Michigan Manual on Uniform Traffic Control Devices (MMUTCD), this Special Provision and any Supplemental Specifications and/or details in the Project Manual, the Macomb County Department of Roads (MCDR), and the Michigan Department of Transportation (MDOT).

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During progress of the work, the Contractor shall accommodate both vehicular and pedestrian traffic to the extent possible, as provided in these specifications and accompanying drawings, or in the absence of specific requirements he shall maintain such traffic in accordance with the Michigan Manual of Uniform Traffic Control Devices and MCDR.

The Contractor shall coordinate his work with other Contractor's that may be performing work within the Construction Influence Area (CIA), or adjoining areas, to avoid conflicts in the maintenance of traffic or construction signing, and to provide for the orderly and safe progress of Contract work.

Access to fire hydrants, water and gas valves shall always be maintained. The Contractor's truck and equipment operations on public streets shall be governed by all local traffic ordinances and regulations of the Engineer and MCDR. Access shall be maintained for emergency vehicles to all areas within the construction zone at all times.

The Contractor shall inform the Engineer, MCDR and MDOT in advance of his program of street obstruction and detours, so that the Engineer, MCDR and MDOT can set up plans for servicing the area in case of an emergency. Contractor shall also notify the Shelby Township Department of Public Works, Police and Fire Departments at least three (3) days prior to obstructing any street.

Pre-Staging of Traffic Control Devices:

Prior to beginning any work, the Contractor shall erect all advance warning signage utilizing "Traffic Regulator Control" and "Minor Traf Devices".

After the signing has been established, the Contractor shall begin erecting any barricading which is required. All advance warning signage shall be in place before any barricading is erected.

All taper and buffer space lengths shall be in accordance with the MDOT Maintaining Traffic Typical "Tables for "L", "D" and "B" values."

Two-way traffic movements shall be accommodated during the progression of work at all times.

No Lane Closures will be permitted during "Pre-Staging of Traffic Control Devices".

All shoulder closures shall be made in accordance with the MDOT Maintaining Traffic Typical "M0110a".

"Traffic Regulator Control" and "Minor Traf Devices" shall be incorporated as necessary to provide safe and orderly traffic alterations.

All conflicting signs and/or pavement markings within the CIA shall be covered or removed as determined in the field by the Engineer.

Inspect and adjust accordingly all traffic control measures to ensure a safe and manageable layout for the traveling public and miscellaneous work crews during construction.

The Contractor's traffic control plan will be carefully reviewed at the pre-construction meeting prior to implementation and any modification to the plan shall be reviewed and approved by the Engineer, Owner and MCDR.

If traffic conditions require that the plan be modified for a particular problem, the Contractor shall comply with the modifications as required by the Engineer, Owner and MCDR.

The Contractor shall provide flagmen, warning lights, signs, and barricades necessary to direct and protect vehicular and pedestrian traffic.

Traffic signs and control devices shall be in conformance to the Michigan Manual of Uniform Traffic Control Devices, current issue.

The Contractor shall routinely maintain all traffic control devices.

The Contractor shall be responsible for protecting the work area and must supply the necessary traffic control devices apart from those called for on the plans to delineate the work area from the adjacent property.

Signs:

All temporary signs used on this project shall be fabricated utilizing prismatic retro-reflective sheeting.

All diamond warning signs shall be minimum 48" x 48".

All temporary signs shall have a minimum bottom height of 7'.

All warning signs with supplemental plaques shown below the warning sign shall be installed on driven supports per WZD-100-A. In areas where driven supports are not possible, the supplemental sign shall be placed on separate supports under the parent sign. The minimum bottom height of the supplemental plaque shall not be less than 1' below the normal bottom height of the parent sign.

No signs shall be attached to Type III Barricades.

Unless otherwise noted on the sign layout plans, all temporary special signs shall be installed on steel posts. The cost of steel posts, both driven and on portable supports, and the cost of relocating the sign and supports, shall be included in the cost of the sign.

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Temporary sign supports shall be designed in accordance with the MDOT chart for wind loading. All driven sign supports used for temporary signs shall be installed in accordance with special detail WZD-100-A, including meeting all requirements for breakaway supports.

Temporary signs shall be installed on driven posts, except where located in pavement or those required to be relocated frequently to perform moving operations.

The Contractor shall place W20-1 (ROAD WORK AHEAD) signs on all intersecting local roads where construction activities may be encountered.

Unless otherwise noted on the plans, all applicable existing/proposed signs are assumed to be in place during construction. All existing signs in conflict with the temporary traffic control shall be covered. Conflicting Type II and III signs shall be identified in the field by the Engineer and Contractor. When ground-mounted signs on this project are to be covered, they shall be covered in accordance with Section 812.03 of MDOT 2012 Standard Specifications for Construction.

All signs, temporary or permanent, which are damaged as a result of improper sign covering, shall be replaced at the Contractor's expense.

Existing signs located within the construction influence area shall be removed and salvaged as necessary to facilitate construction activities. Upon completion of construction and prior to the removal of temporary signing and barricading, the signs shall be re-erected in their pre-construction location. All signs damaged by the Contractor or otherwise deemed unsalvageable shall be replaced by the Contractor. The cost for removing, salvaging, and erecting existing signs and for furnishing replacement signs shall be included in this item of work.

Channelizing Devices:

Lighted Arrows shall be used when closing a traffic lane.

Channelizing devices used on this project shall be plastic drums with high intensity sheeting. The use of cones or other channelizing devices will not be allowed on this project, except where approved by the Engineer.

The spacing of channelizing devices shall be as shown below, unless otherwise called for in the plans or as directed by the Engineer. In general, the spacing shall be as follows:

50 feet in tangents

25 feet in shifts or tapers

10 feet at locations where tight traffic control is required

The Contractor shall also place a plastic drum at the limits of all pavement repair removals, sidewalk removals, driveway removals, and open excavations.

Placement of Type III Barricades, Lighted, shall be as shown on the plans or as directed by the Engineer.

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Temporary concrete barriers shall be utilized where an open excavation is adjacent to a vehicular travel lane as directed by the Engineer.

The Contractor shall furnish, erect, maintain, and remove all traffic control devices, including lights, required to protect the construction area and the public.

The Contractor shall catalog the existing pavement markings prior to the commencement of work. Copies of the existing pavement markings catalog shall be provided to the Engineer. All pavement markings removed for traffic control measures shall be replaced prior to re-opening lanes to traffic. All pavement markings, special markings (symbols), and dimensions shall conform to MDOT Pavement Marking Details (PAVE-900-A to PAVE-990-A), unless specified otherwise by special provision or details provided within this document.

All pavement markings on this project shall be as follows:

Lane Line	Sprayable Thermoplastic
Symbol	Overlay Cold Plastic

The cost for all traffic control, signing, barricades, flasher boards and traffic regulators shall be measured and paid for at the contract price per lump sum for "Traffic Control and Maintenance".

The cost for salvaging and re-erecting permanent signs required to be moved for the progression of the work shall be included in the Pay Item "Sign – Remove, Salvage and Re-Erect". All permanent pavement markings shall be replaced by the Owner upon completion of the work.

52. PROPERTY IRONS

All property irons and monuments disturbed or destroyed by the Contractor’s operations shall be replaced by a Registered Land Surveyor provided by or caused to be provided by the Contractor at the Contractor’s expense and in conformance with Section 821 of the Standard Specifications.

53. MAILBOXES AND MISCELLANEOUS LANDSCAPE STRUCTURES

Contractor shall protect all mailboxes, decorative landscaping, sprinklers, yard lights, stone headwalls, etc. Any damage incurred during construction shall be restored unless noted otherwise on the plans to original condition or better at no additional cost to the Township. As part of the Contractor’s approved construction phasing plan, the Contractor shall include the necessary steps to maintain mail service throughout the period of the Contract.

54. DEPARTMENT OF ROADS RIGHT OF WAY

All work within the Macomb County road rights-of-way (ROW) will require a Macomb County Department of Roads (MCDR) permit and will conform to their required standards. The Contractor shall coordinate with MCDR to perform the sanitary sewer construction and shall complete all work necessary to meet permit requirements and specifications of MCDR. The Contractor is cautioned to minimize construction and construction related traffic impacting 25 Mile Road, Schoenherr or Hayes Roads. Any construction related damage to the road surfaces will be repaired by the Contractor at no cost to the Owner. The cost

to complete the work required under the permit will be included in the contract unit prices as stated in the proposal and at no additional cost to the Owner.

55. INCIDENTAL CONSTRUCTION

Unless otherwise indicated on the Drawings or in these Specification, all site restoration, including, but not limited to, ditch restoration; fence removal and replacement; mailbox removal and replacement; storm sewer removal and replacement; road, shoulder, driveway repair and restoration shall be completed by the Contractor in accordance with the Contract Documents and the cost of such restoration shall be considered included in the cost of the project and no separate payment shall be made therefore.

56. SIGN – REMOVE, SALVAGE AND RE-ERECT

This work includes all labor, equipment, and materials necessary to remove, salvage and re-erect the existing signs as shown on the plans or encountered during construction according to MDOT Section 810 of the 2012 Michigan Department of Transportation Standard Specification.

The item of work “Sign – Remove, Salvage & Re-Erect” shall be paid for as Lump Sum (LS) and include all materials, labor, and equipment necessary to perform this work.

57. MONITORING VIBRATION AND CONDITION SURVEY

This work shall consist of furnishing all the necessary labor, materials, and equipment to monitor vibrations and settlement during required demolition and subsequent construction of this project, and to assure that vibrations and/ or settlement are within tolerances set forth in this special provision. This work shall also include but not limited to inspection and video documentation of the residential & commercial building structures adjacent to the construction prior to the start of construction, and after construction has concluded. Contractor is referred to AASHTO Designation: R 8-96 “Standard Recommended Practice for Evaluation of Transportation-Related Earthborne Vibrations” for guidance in addition to this special provision.

Prior to construction, the Contractor shall inspect and video the existing condition of both structures and property located at the addresses (approximately sixteen) identified by the Township Engineer and primarily along 25 Mile Road. The Contractor shall coordinate the date and time of the inspection of these required residences with the Township and the property owner. Should the property owner refuse access for inspection and documentation of the property and/or structure condition, the Contractor will document the refusal by the property owner and conduct and document and exterior inspection of the structure. The video documentation and inspection will be professionally reviewed and approved to the satisfaction of the project Owner, Engineer and the Contractor prior to commencing construction adjacent to the property in question.

The Contractor shall provide materials, labor, and equipment necessary for performing a video inspection. Use high quality, color, on an approved media at a standard play speed and equipment which allows both audio and video information to be recorded. Control pan and zoom rates to ensure playback clarity, and provide lighting for the camera if necessary. Also provide audio commentary as necessary during filming to enhance documentation of existing conditions. Special consideration shall be given to any existing structural defects, including but not limited to, measurement of any crack lengths and widths.

After completion of the video inspection, the Contractor shall furnish two copies of the video to the Engineer. A written description of any existing damage shall be included. The submitted video and written

description must be approved by the Engineer prior to the start of construction.

A post-construction video inspection shall also be completed following the same procedure as above.

“Monitoring Vibration and Condition Survey” will be included in the Contract unit lump sum price bid for “Audio-Visual Record of Construction Area”. Payment for this item will include all labor, materials and equipment necessary to complete the pre and post-construction video record documents.

58. REMOVAL OF 12-INCH TO 24-INCH DIAMETER BOULDERS FROM CASING

Removal of rocks, cobbles and boulders encountered during work item “**STEEL CASING PIPE, ___ INCH, JACKED IN PLACE**” which are smaller than the smallest diameter of the boulder bid item (12 inch diameter) shall be considered incidental. Removal of boulders encountered during bore and jack operations which are greater than the larger diameter of the boulder bid item (24 inch) shall be considered additional work for which the contractor will be compensated on a negotiated time and material basis.

Boulders shall be removed by drilling, jack hammering, wedging, sledging, expansive cement, barring, or other means as approved by the ENGINEER in advance. Blasting will be allowed only when approved in advance by the ENGINEER. Boulders shall be paid for at the contract unit price per each. Price shall include all items including but not limited to equipment damage, earth stabilization if required, dewatering, blasting (if approved) and crew hours. Boulder diameter shall be defined as the average of the measured distance between edges of the boulder in the tunnel bore in three perpendicular directions.