

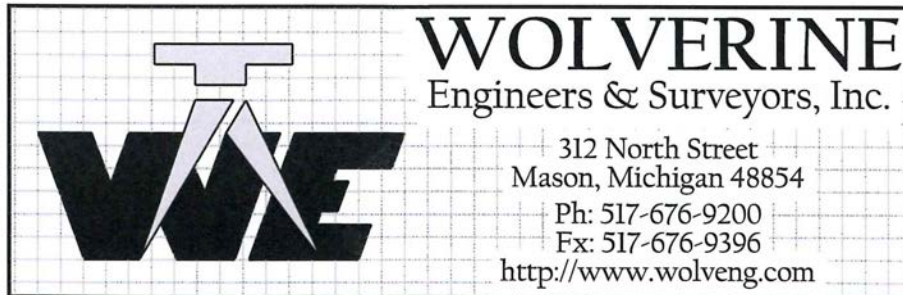
**CITY OF GRAND LEDGE
EATON COUNTY, MICHIGAN**

**CONTRACT DOCUMENTS
AND
SPECIFICATIONS**

FOR

RIVER STREET, SANITARY SEWER

DECEMBER 2023



**CITY OF GRAND LEDGE
EATON COUNTY, MICHIGAN**

CONTRACT DOCUMENTS AND SPECIFICATIONS

FOR

RIVER STREET, SANITARY SEWER

DECEMBER 2023

WOLVERINE ENGINEERS & SURVEYORS, INC.
312 NORTH STREET
MASON, MI 48854
517 676-9200
JOB 23-0049

RIVER STREET, SANITARY SEWER

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ADVERTISEMENT FOR BIDS

The **CITY OF GRAND LEDGE**, Eaton County, Michigan, will receive sealed bids for **RIVER STREET, SANITARY SEWER** until **10:00 a.m.**, Local Time, **Tuesday, January 16, 2024** at the City of Grand Ledge, 310 Greenwood St., Grand Ledge, MI 48837. At that time and place all bids received shall be publicly opened and read aloud.

General Description

This project consists of reconstruction of **RIVER STREET, SANITARY SEWER**; all within the City of Grand Ledge City Limits:

Construction shall include: the relocation of an existing 18-inch sanitary sewer with 288 linear feet of 18-inch PS 155 PVC pipe; temporary by-pass pumping of sanitary sewage; 1450 square feet of sidewalk removal and replacement; 180 linear feet of concrete curb and gutter removal and replacement; 4,100 square feet of HMA removal; 450 square yards of MDOT 21 AA aggregate base (8 inches CIP); 75 tons of MDOT HMA leveling course; 18-inch sewer bulkheading and abandonment by flowable fill; signing and traffic control, complete cleanup and restoration, and other miscellaneous work items that are normally included with the described work items.

Documents - IMPORTANT

The Issuing Office for the Bidding Documents is: **Wolverine Engineers & Surveyors, Inc., 312 North Street, Mason, MI 48854, Phone 517.676.9200**. Prospective Bidders may obtain copies of the Bidding Documents from the Issuing Office as described below.

Contract Documents for the project will be on file and available for inspection at the offices of the City of Grand Ledge, 310 Greenwood St., Grand Ledge, MI 48837; and at the offices of Wolverine Engineers and Surveyors, Inc. 312 North Street, Mason, MI 48854; Builders Exchange offices in Lansing, Kalamazoo, and Grand Rapids, Construction Association of Michigan in Bloomfield Hills, Michigan.

Electronic Bidding Documents will be furnished **free-of-charge** by registering with Wolverine Engineers & Surveyors, Inc. **All bidders MUST register with Engineer by sending an email to janicer@wolveng.com requesting to be added to the bidders list.** Registering ensures timely receipt of all addenda. Following registration, complete hard copy sets of Bidding Documents may be purchased from the Issuing Office and cost will depend on the number and size of the Drawings and Project Manual, applicable taxes, and shipping method selected by the prospective Bidder. Cost of Bidding Documents and shipping is non-refundable. Upon the Issuing Office's receipt of payment, printed Bidding Documents will be sent via the prospective Bidder's delivery method of choice; the shipping charge will depend on the shipping method chosen. The date that the Bidding Documents are transmitted by the Issuing Office will be considered the Bidder's date of receipt of the Bidding Documents. Partial sets of the Bidding Documents will not be available from the Issuing Office.

Bid Bond

Each bid proposal shall be accompanied with a bid bond, certified check or cashier's check payable to the Owner in an amount not less than five percent (5%) of the bid as a guarantee that the bidder shall, within ten (10) days after the award of a contract, execute a contract or agreement and file necessary insurance and other bonds if selected as the accepted bidder. If the selected awardee fails to properly execute the necessary bonds, agreement, and insurance requirement, the bid bond shall be deemed forfeited to the Owner as liquidated damages.

Bid Rejections

The Owner reserves the right to accept, reject or negotiate any or all bids, to waive or not to waive informalities in bids or bidding procedures and to accept any bid determined to be in the best interest of the Owner, whether a bid is lowest or not.

Bids shall be held for consideration for a period of time not to exceed SIXTY (60) days from the date of bid opening without increase in cost bid for the project. Further time extension may occur only with mutual agreement by the Owner and the successful bidder and the Surety Company issuing the bid bond for the successful bidder. The Owner also reserves the right to reject any or all bids received which are judged by the Owner to not serve the best interests of the Owner in the conduct of this project.

The Owner shall have the right to determine if bids are responsive and responsible and to waive defects or irregularities in any bid if it appears in the best interest of the Owner to do so.

GREGORY NEWMAN, CLERK

INFORMATION FOR BIDDERS

1. Description of Work

The work consists of doing everything required to be performed and providing and furnishing all of the labor, power, materials as described in the Specifications and Drawings, necessary tools and equipment, Workman's Compensation and Property Damage and Public Liability Insurance, superintendence and all utility and transportation services required to complete in a workmanlike manner all the work required.

2. Location of Work and Soil Conditions

The work required under this contract is located upon sites owned by the Owner and/or rights-of-way obtained by the Owner.

The bidder shall base his bid upon his personal information on soils, soil conditions, roadways and working areas, facilities for receiving, transporting, handling, storing and placing materials and equipment and shall base his bid upon his personal knowledge of environment and physical conditions which he may encounter during construction. This personal knowledge must be obtained by the bidder from his own detailed inspection of the proposed construction site together with information such as he shall personally acquire or obtain from his own observations and investigations.

The Owner and the Owner's Engineer shall have no financial or other responsibility for soil conditions which may be encountered by the bidder and/or contractor because of soil, physical or environmental conditions or circumstances.

3. Owner

The word "Owner" as used in the Specifications and Contract Documents shall refer to the **CITY OF GRAND LEDGE**, Eaton County, Michigan.

4. Basis of Proposals

Proposals are solicited for the construction of the work as shown on the Drawings and/or as described in the Specifications at prices as listed on the Proposal blanks. The quantities given are to be regarded as approximate only and as being given for the general guidance of the bidders and as a basis upon which the different proposals will be compared. In comparing proposals, the total Base Bid Price will be used as the basis of award. Bid prices will be corrected for errors in extensions or additions.

5. Form of Proposals

All proposals must be submitted on the form prepared for that purpose, which are titled "Bid Proposal". Each Bid Proposal, included with the Contract Documents, shall be enclosed in a sealed envelope, addressed to: "**City of Grand Ledge, 310 Greenwood Street, Gand Ledge, Michigan 48837**" and clearly marked on the outside of the proposal packet "**RIVER STREET, SANITARY SEWER**".

6. Interpretation of Contract Documents

If any individual, corporation or partnership contemplating submitting a bid for the proposed contract is in doubt as to the true meaning of any part of the Drawings, Specifications, or other parts of the documents, he may submit to the Owner a written request for an interpretation thereof. The person submitting the request will be responsible for its prompt delivery. Any interpretation of the documents will be made by an addendum issued by the Engineer. A copy of such addendum will be mailed or delivered to each person receiving a set of the documents and to such other prospective bidders as have requested that they be furnished with a copy of each Addendum.

7. Bid Bond Required

Each bid must be accompanied by a certified or cashier's check, or a bid bond in a sum not less than five percent (5%) of the total amount of the bid, made payable to the Owner.

The proceeds of such checks or bid bonds shall become the property of the Owner in case of refusal or failure of the individual, corporation or partnership to whom the award is to be made, to enter into a contract with the Owner within ten (10) days after formal notification.

8. Return of Bid Bond

The bid bond of all except the three (3) apparent lowest bidders will be returned within three (3) days after the opening of the bids. When the Agreement is executed, the bonds of the two remaining unsuccessful bidders will be returned. The Bid Bond of the successful Bidder will be retained until the Payment Bond and Performance Bond have been executed and approved, after which it will be returned.

9. Withdrawal of Bids

Any bidder may withdraw his bid prior to the scheduled time for receipt of bids. No bidder may withdraw his bid for a period of SIXTY (60) days from the date of bid opening.

10. Basis of Award

The contract for this construction shall be awarded to the lowest responsive, responsible bidder. The lowest bid shall be determined on the basis of the lowest bid for the total of all sections of the bid proposal.

The procedure for Bid Award shall be as follows:

- (1) Open Sealed Bids
- (2) Engineer reviews Bid Proposals and makes recommendation for award to Owner.
- (3) Decision by Owner.

Prior to final award of the contract, the Bidder shall be required to furnish evidence satisfactory to the Owner and to the Engineer that the Bidder has the facilities, equipment, ability and pecuniary resources to fulfill the conditions of the contract.

11. Right to Reject and Waive Defects

The Owner shall have the right to determine if bids are responsive and responsible, and to waive minor defects or irregularities in any Proposal, if it appears in the interest of the Owner to do so. Bids which contain stipulations shall not be considered.

12. Bid Proposal

The Bidder is cautioned that each item contained in the Bid Proposal and supplemental documents must be properly completed for the bid to be considered.

THE BIDDER SHALL COMPLETE THE FOLLOWING:

- (1) Proposal which includes legal status of bidder (Prop)
- (2) Bid Bond or attached bid certificate (B. Bond)

The legal status of the bidder, that is, as a corporation, a partnership, or an individual, must be stated in the Proposal. A corporation bidder must name the state in which its articles of incorporation are held and must give the title of the official having authority to sign contracts. A partnership bidder must give the full name and post-office address of all partners. (See Bid Proposal).

The official address of each Bidder must be provided in the Bid Proposal. All proposals shall be in full conformity with all conditions set forth in the Information to Bidders, Contract, Specifications and Drawings.

13. Owner Right to Reduce Scope of Work

If the apparent lowest, responsive, responsible bidder exceeds the funds available to the Owner for the project, the Owner shall then have the right to reduce the scope of the work, delete items in the Bid Proposal or reject all bids.

Changes in project scope as-bid shall be by Change Order No. 1 which shall be agreed to by the Owner and the Contractor and which shall be signed at the same time as the Contract.

14. Time for Consideration of Proposals

The Owner shall have SIXTY (60) days to consider the award of the Contract. If no contract is awarded within SIXTY (60) days from the date of bid opening, all bids and proposals shall be considered as automatically rejected.

15. Execution of Contract

The Bidder to whom the contract is awarded will be required to execute the Contract and obtain the performance BOND and payment BOND within ten (10) calendar days from the date when NOTICE OF AWARD is delivered to the BIDDER. The NOTICE OF AWARD shall be accompanied by the necessary Contract and BOND forms. In case of failure of the BIDDER to execute the Contract, the OWNER may consider the BIDDER in default, in which case the BID BOND accompanying the proposal shall become the property of the OWNER.

The OWNER within ten (10) days of receipt of acceptable performance BOND, payment BOND and Contract signed by the party to whom the Contract was awarded shall sign the Contract and return to such party an executed duplicate of the Contract. Should the OWNER not execute the Contract within such period, the BIDDER may by WRITTEN NOTICE withdraw the signed Contract. Such notice of withdrawal shall be effective upon receipt of the notice by the OWNER.

The NOTICE TO PROCEED shall be issued within ten (10) days of the execution of the Contract by the OWNER. Should there be reasons why the NOTICE TO PROCEED cannot be issued within such period, the time may be extended by mutual agreement, between the OWNER and CONTRACTOR. If the NOTICE TO PROCEED has not been issued within the ten (10) day period or within the period mutually agreed upon, the CONTRACTOR may terminate the Contract without further liability on the part of either party.

16. Bonds

The successful bidder will be required to execute three (3) bonds, in the forms hereto attached, with sureties acceptable to the Owner. One bond shall be conditioned for the faithful fulfillment of the Contract and to include the protection of the Owner from all liens and damages arising out of the work; another bond to be conditioned for the payment of all labor and materials used in the work and the protection of the Owner from all liens and damages arising therefrom; each of which bonds shall be in amount equal to the total amount of the contract. The third bond shall be a Maintenance and Guarantee Bond in the amount of one hundred percent (100%) of the contract price. All bonds shall extend from time of issuance of a "Notice to Proceed" by the Owner. The Maintenance and Guarantee Bond shall be for a period of one (1) year from the date of the payment of the final estimate.

17. Contractors Insurance

The Contractor shall not commence work under this Contract, until he has obtained all 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 subcontract until all similar insurance required of the subcontractor has been so obtained and approved.

In addition to the insurance requirements of paragraph 21, "Insurance" of the General Conditions, the Contractor shall provide the following coverages:

- a. Compensation Insurance. --The Contractor shall take out and maintain during the life of the Contract, Worker's Compensation Insurance in accordance with the Worker's Compensation Law of Michigan, for all of his employees employed at the site of the project, and in case any work is sublet, the Contractor shall require the subcontractor similarly to provide said insurance for all of the latter's employees, unless such employees are covered by the protection afforded by the Contractor.
- b. Public Liability and Property Damage Insurance.--The Contractor shall take out and maintain during the life of the Contract such Public Liability and Property Damage Insurance as shall protect him and any Subcontractor performing work covered by the Contract, including owned and non-owned automobile insurance, and protect and hold the Owner, **CITY OF GRAND LEDGE, EATON COUNTY DRAIN COMMISSION, and WOLVERINE ENGINEERS & SURVEYORS, INC.**, harmless from claims for damages for personal injury, including accidental death, as well as from claims for property damages, which may arise from operations under this contract, whether such operations be by himself, or by any Subcontractor or by anyone directly or indirectly employed by either of them. The amounts of such insurance shall be as provided herein.
- c. Indemnification-Owner's Protective Insurance.--The CONTRACTOR shall purchase an Owner's Protective Insurance Policy which will indemnify and hold harmless the OWNER and the ENGINEER and their agents and employees from and against all claims, damages, losses and expenses including attorney's fees arising out of or resulting from the performance of the WORK, provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting therefrom; and is caused in whole or in part by an negligent or willful act or omission of the CONTRACTOR, and SUBCONTRACTOR, any directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

In any and all claims against the OWNER or ENGINEER, or any of their agents or employees, by any employee of the CONTRACTOR, any SUBCONTRACTOR, anyone directly or indirectly employed by any of them,

or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the CONTRACTOR or any SUBCONTRACTOR under workmen's compensation acts, disability benefit acts or other employee benefits acts.

The Owner's Protective Indemnification Insurance Policy shall specifically name as insured, the **City of Grand Ledge, Eaton County Department of Transportation and Roads, Eaton County Drain Commission, and Wolverine Engineers & Surveyors, Inc.** Certificate of this policy and coverage shall be provided prior to commencement of work.

Insurance and additional insured: The contractor shall provide for and on behalf of the state, the commission, the department and its officials, agents and employees, and all agencies specifically named below and their employees, Owner's Protective Public Liability Insurance. Such insurance shall provide coverage and limits the same as the Contractor's Public Liability Insurance.

- d. Underground Collapse and Explosion -- The Contractor shall take out and maintain during the life of the Contract, coverage for Underground Collapse and Explosion Insurance as shall protect him and any Subcontractor performing work covered by the Contract, from claims for damages that may arise from operations under this Contract, whether such operations be by himself or by any subcontractor or by anyone directly or indirectly employed by either of them and the amounts of such insurance shall be as follows.

- e. Builders Risk Insurance--The Contractor shall provide all Builders Risk Insurance for damage by fire, explosion and other causes to any part of the construction, which fully protects him and the Owner from loss or damage while the project is under construction and prior to the full acceptance thereof by the Owner. The policies shall be payable to the Contractor and to the Owner as their interests may appear.

- f. Minimum coverage limits for Public Liability Insurance and Owner's Protective Insurance shall be as follows:

Bodily Injury - \$ 1,000,000/\$ 1,000,000 Aggregate
Property Damage - \$1,000,000 Aggregate
Combined Single Limit - \$ 2,000,000

- g. The Surety & insurance companies providing all coverages on this Project shall have and maintain during the term of this contract a minimum A.M. Best (Best's Key Rating Guide) rating classification of "A-".

- h. Standard language regarding cancellation will be as follows: "***Should any of the above-described policies be cancelled before the expiration date thereof,***

the issuing insurer will provide by first class mail 30 days written notice to the certificate holder.” The language “failure to do so shall impose no obligation or liability of any kind upon the insurer, its agents or representatives”, shall be struck from the certificate(s).

18. Time of Starting and Completion

The work to be done is to be started by the Contractor at the site, fifteen (15) calendar days after receipt of written "Notice to Proceed", unless the Owner shall, in writing authorize a further delay, and the work shall be prosecuted diligently thereafter and shall be completed as stated in Section 21, Information to Bidders unless the time shall be extended by the Owner under the provisions of the Contract.

19. Definition of Notice

Where in any of the Contract Documents there is any provision to the giving of any notice, such notice shall be deemed to have been given: (1) As to the Owner, when written notice shall be delivered to the Engineer of the Owner, or shall have been placed in the mails addressed to the chief executive officer of the Owner at the place where the bids for the Contract were opened; (2) As to the Contractor, when a written notice shall have been delivered to the chief representative of the Contractor at the site of the work or by mailing such notice to the Contractor at the place stated in the papers prepared by him to accompany his proposal as the address of his permanent place of business; (3) As to the surety, on the performance bond when a written notice is placed in the United States Mails addressed to the surety at the home office of said surety or to its agents who executed such performance bond in behalf of such surety.

20. Payments to Contractor

Payments to Contractors will be made in accordance with General Conditions, Paragraph 19 and with Act 524 of Michigan Public Acts of 1980, as applicable. In preparing estimates, the material delivered on the site and preparatory work done may be taken into consideration.

All material and work covered by partial payments made shall thereupon become the sole property of the Owner, but this provision shall not be construed as relieving the Contractor from the sole responsibility for the care and protection of materials and work upon which payments have been made or the restoration of any damaged work, or as a waiver of the right of the Owner to require the fulfillment of all of the terms of the Contract.

Final payment to the contractor shall not be made until final acceptance of all work under this Contract. Final acceptance shall mean acceptance and approval by the Owner and Engineer of the entire work under this Contract and approval of all records and other written data required in the Contract Documents. A Consent of Surety for Final Payment must be submitted before releasing all the retainage.

21. Time of Completion and Liquidated Damages

Bidder must agree to commence work on or before a date to be specified in a written “Notice to Proceed@ of the Owner and to fully complete the various items of construction within 30 consecutive calendar days and in accordance with any intermediate completion dates as outlined and described in the Schedule of Construction in the Special Conditions of the Specifications. It is an important part of this Contract that the various sections of the work be completed on a planned time schedule and the Contractor shall adhere to the requirements of the Schedule for Construction unless the schedule is changed by the Engineer in writing.

The Contractor agrees to pay as liquidated damages the sum as listed in the Bid Proposal, for each successive calendar day that the Contractor or any Subcontractor shall be in default beyond the date of completion or beyond any intermediate date required in the Schedule of Construction. Liquidated damages shall be imposed in accordance with Paragraph 15 "Time for Completion and Liquidated Damages," of the General Conditions.

22. Elliott-Larsen Civil Rights Act

Neither the Contractor nor any of its subcontractors shall discriminate against any 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 or marital status, and Contractor agrees that all subcontracts will provide language substantially identical to that set forth herein. It is further understood that a breach of this covenant may be regarded as a material breach of this contract.

23. Michigan Handicappers’ Civil Rights Act

Incorporated by reference in Section 209 of Article 2 of the Michigan Handicappers’ Civil Rights Act of 1976, as amended, which states in part that a contractor and his/her subcontractor(s) shall not “discriminate against an employee or applicant for employee with respect to hire, tenure, terms, conditions, or privileges of employment, or a matter directly or indirectly related to employment, because of handicap that is unrelated to the individual’s ability to perform the duties of a particular job or position.” Breach of this covenant may be regarded as a material breach of this Agreement.

24. Americans With Disabilities Act

Incorporated by reference in Section 102 of the American With Disabilities Act, 42 U.S.C. Subsection 12112, which provides that no covered entity shall discriminate against a qualified individual with a disability because of the disability of such individual with regard to job application procedures, the hiring, advancement, or discharge of employees, employee compensation, job training, and other terms, conditions and privileges of employment, and Section 202 of the Americans With Disabilities Act, 42 U.S.C. Subsection 12132, which provides that no qualified individual with a disability shall, by reason of such disability, be excluded from participation in or be denied the benefits of the services, programs or activities

of a public entity or be subject to discrimination by any such entity.

25. Non-Discrimination Statement

The (Recipient), in accordance with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42 U.S.C. 2000d to 2000d-4 and Title 49, Code of Federal Regulations, Department of Transportation, SubTitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally assisted programs of the Department of Transportation issued pursuant to such Act, hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, minority business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

**SPECIAL CONDITIONS
(Project Specifications)
CITY OF GRAND LEDGE**

RIVER STREET, SANITARY SEWER

1. General

These Special Project Conditions are intended to modify, add to, or clarify the Contract Plans and Specifications.

Where any section of the Contract Documents is supplemented by these Special Project Conditions, the section shall remain in effect and the Special Project Conditions shall be considered added thereto.

The Special Conditions of the Contract (Project Specifications, Standard Specifications, Advertisement, Information for Bidders, and General Conditions), together with the Bid Proposal, Contract and Bonds have been bound together for convenience and together with the Plans shall govern this construction and shall constitute the Contract Documents.

2. Description of the Project

This project consists of reconstruction of **RIVER STREET, SANITARY SEWER** all within the City of Grand Ledge City Limits:

Construction shall include: the relocation of an existing 18-inch sanitary sewer with 288 linear feet of 18-inch PS 155 PVC pipe; temporary by-pass pumping of sanitary sewage; 1450 square feet of sidewalk removal and replacement; 180 linear feet of concrete curb and gutter removal and replacement; 4,100 square feet of HMA removal; 450 square yards of MDOT 21 AA aggregate base (8 inches CIP); 75 tons of MDOT HMA leveling course; 18-inch sewer bulkheading and abandonment by flowable fill; signing and traffic control, complete cleanup and restoration, and other miscellaneous work items that are normally included with the described work items.

It is the intent of these specifications to require the Contractor to furnish all necessary labor equipment, materials, tools, power, insurance and supervision for the complete construction of the work described in the specifications and shown on the plans as required by the Engineer.

3. Schedule of Construction

The Contractor shall, at the preconstruction meeting, provide a schedule of construction showing the start and completion date for all streets in this project. The schedule shall limit the number of streets under construction at any one time.

The Owner reserves the right to amend the schedule if severe conflicts are perceived.

4. Scope of Project

The Owner may increase or decrease the scope of work in this project to match funds available. If mutually agreeable, unit prices may be extended into 2024 for that annual street program, taking into account an annual allowance for the cost of liquid asphalt.

5. Use of Michigan Department of Transportation Standard Specifications

The handbook entitled "2012 Standard Specifications for Construction" adopted by the Michigan Department of Transportation shall be a Contract Document for this construction project and shall be binding when cited in these specifications, construction drawings and plans or related Contract Documents. The handbook cited shall hereinafter be referred to as MDOT Standard Specifications, or alternatively MDOT Specifications.

MDOT Standard Specifications shall, when cited, be binding in its entirety except when specifically modified, in which instance the applicable Special Conditions shall govern.

6. Disposition of Surplus Excavated Material

All surplus earth excavation from trenches, roadway embankment, or slope excavation shall become property of the Contractor. All surplus material not required for making fills, and other materials such as bituminous pavement shall be hauled and disposed of by the Contractor in a safe legal manner, and all other materials shall be incidental to the cost of construction unless otherwise stated in the Bid Proposal.

7. Excavation, Filling and Grading

This work shall include all removing, stripping, excavation of earth and other materials, filling, hauling and other work necessary for the construction of a public street, to conform to the finish elevations and contours as described in the Specifications and shown on the Plans. All areas to receive fill or stockpiled spill shall have the topsoil stripped prior to placement of the material. Topsoil shall be stripped and stockpiled on site as directed by the Engineer for future use by the Owner. The work shall include fine grading and cleanup of the construction site upon completion of the work.

The Contractor shall accomplish all clearing within the limits designated by the Engineer or as required for the construction work involved and shall dispose of all materials so removed to the satisfaction of the Engineer.

Existing topsoil shall be removed and stockpiled on the site and after grading is completed, the topsoil shall be replaced to a minimum depth of 4" over all disturbed areas. After fine grading, the area shall be fertilized, mulched and seeded with a good quality lawn seed as defined under Standard Project Requirements, Page SPR 10, Item 28.

8. Project Scope

The Owner may increase or decrease the scope of work under this contract, including adding or deleting entire streets as funds allow. If work is added to the contract, additional time for completion will be negotiated. The unit prices bid under this contract will be used for any added or deleted work. If different unit prices are bid for like items, the Owner will use the lower price for added work, if any.

9. Coordination of Construction Activities

The Contractor shall be responsible for coordinating the activities of his work crews with the activities of his subcontractors and with the Owner, all local police, fire and emergency services, and any other public or private contractors performing work activities in the project area.

10. Utility Coordination

For protection of underground utilities and in conformance with Public Act 53, the contractor shall contact Miss Dig at **800-482-7171** a minimum of three full working days, excluding Saturdays, Sundays, and holidays prior to any 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.

The owners of existing service facilities that are within grading or structure limits will move these facilities to locations designated by the Engineer or will remove them entirely from the street Right-of-Way. Owners of Public Utilities will not be required by the City 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 operations.

No additional compensation will be paid to the Contractor for delays due to material shortages or other reasons beyond the control of the County/City, or for delays on construction due to the encountering of existing utilities that are, or are not, shown on the plans.

Work stoppage by employees of utility companies which results in a delay of utility revisions on any portion of this project may be considered the basis for a claim for an extension of time for completion but will not be considered the basis for a claim for extra compensation or an adjustment in contract unit prices.

11. Joint Restraint Gaskets or Mechanical Joint Restraints

Where soil or installation conditions preclude the use of concrete thrust blocks as specified and detailed on the Plans, the Contractor may install a JOINT RESTRAINT GASKET SYSTEM in lieu of the thrust block on ductile iron pipe. The gasket shall be compatible to the pipe supplied

and furnished by the pipe manufacturer. The gasket shall be capable of joint restraint for pipe under working pressures up to 250 psi. Prior to installation, the JOINT RESTRAINT GASKET SYSTEM supplier shall provide assistance to the Contractor and Engineer in calculating the required length of pipe to be restrained at thrust locations such as fittings and dead ends. JOINT RESTRAINT SYSTEMS shall be similar and/or equal to U.S. Pipe's FIELD LOK (tm) gasket system or Megalug Restrained Joints by EBAA Iron Sales, Inc. Payment shall be incidental to the cost of the pipe.

12. Construction Signage and Maintaining Traffic

It shall be the Contractor's responsibility to furnish and maintain Construction Zone Signage in accordance with the "Michigan Manual of Uniform Traffic Control Devices" (MMUTCD) and any requirements that may be deemed necessary by the City of Mason Police Department.

Every attempt shall be made to provide vehicular access to homes and businesses during construction. Emergency vehicle access shall be maintained at all times. Short term interruptions to residential access shall be coordinated with the Engineer and Property Owners.

13. Incidental Items

The Bid Proposal lists the major work items that will be necessary to construct this project. Any additional items of work that are necessary to complete the project shall be considered incidental. Examples of incidental items include, but are not limited to: removal, temporary relocation, and replacement of mailboxes and mailbox posts, support of existing utilities and repair of existing field tiles and fences encountered during construction.

14. Trimming of Trees and Limbs

The proposed construction will be adjacent to and under many mature trees. It is intended to protect the trees during construction. As such, the Contractor is required to prune any overhanging limbs or branches which may interfere with the operations associated with the installation of utilities.

The branches, limbs, etc. shall be pruned in accordance with accepted practices for pruning as published by the International Society of Arboriculture (217) 355-9411. All pruning shall be completed by a competent, experienced person and/or company. All trimmed limbs or branches shall be removed from the site and properly disposed of by the Contractor.

Any tree, limb or branch damaged during construction operations shall be (pruned) to prevent further damage to the tree. This shall be completed at no additional cost to the project.

Protection of trees shall be incidental to the construction contract.

15. Pavement Removal

The work item Pavement Removal shall consist of all material regardless of thickness, equipment costs, and labor to remove, salvage, and disposal of all types of pavement material including asphalt, brick pavers, concrete, driveways, and any other paving material, or combination, to the full depth and width of removal area. This includes any paving materials layered in combination with granular material.

Disposal of Material

Removed materials shall become the property of the Contractor and shall be disposed of outside the right-of-ways, the Contractor shall furnish the Engineer written permission from the property owner of the disposal site.

Adjacent soils or base materials removed when removing pavement, shall be replaced with a similar material at the Contractors expense.

16. Drive Approaches

All work in this section shall conform to specifications and requirements found in the details in the plan sets, in subsequent sections found in this document, and the MDOT 2012 Standard Specifications and Supplemental Specifications. In addition, all concrete slabs in the drive approaches must have a broomed finish and all contraction joints shall be troweled as indicated in the details for sidewalks.

All work in this section shall be paid for and measure by the square yard at the contract unit prices which shall include all labor, equipment, and materials needed to accomplish the work.

17. Sawcut and Removal

Sawcuts on concrete, bituminous, or a combination thereof shall be made at locations as shown on the plans or as directed by the Engineer. In removing old pavement, curb, gutter, sidewalk, driveways, or similar structures where adjoining surfaces of the existing structures are to be left in the finish work, the old structure shall be removed to existing joints or sawed to a reasonably true line with a power-driven concrete saw to full depth.

The Contractor shall take any precautions necessary to maintain a clean vertical edge on the sawcut throughout the duration of work. Any re-sawing or additional removal and replacement of pavement, curbs, gutter, sidewalk, or combination thereof which may be necessary, due to Contractor carelessness, shall be at the Contractor's expense.

Removed materials shall become the property of the Contractor and shall be disposed in a legal manner. The Contractor shall furnish the Engineer written permission from the property owner of the disposal site.

Adjacent soils or base materials removed when removing pavement shall be replaced with a similar material at the Contractor's expense.

All work in this section shall be measured and paid for by the linear foot at the contract unit prices and shall include all labor, equipment, and materials needed to accomplish the work.

18. Vegetation Removal

This provision covers the removal of all vegetation within the influence of construction area. Removals shall be made at locations as shown on the plans or as directed by the Engineer.

It is the intent that as little as possible vegetation be removed or damaged. It shall be the Contractor's responsibility to provide protection to any vegetation not scheduled to be removed. Any vegetation damaged, destroyed, or removed without prior approval by the Engineer, shall be replaced in kind at the Contractor's expense.

Removed materials shall become the property of the Contractor and shall be disposed of offsite in a legal manner. The Contractor shall furnish the Engineer with written permission from the property owner(s) of the disposal site(s).

Adjacent material and or vegetation removed or damaged when removing existing vegetation shall be replaced in kind the Contractor's expense.

The removal of trees 8 inches to 36 inches in diameter or larger shall be measured per item removed and shall be paid for at the contract unit price per item which shall include all labor, equipment, and materials needed to accomplish the work. All other forms of vegetation, including stumps, to be removed shall be considered incidental and shall be removed and disposed of at the Contractor's expense.

19. Mowing

Mow, pick up litter and dispose of litter. Comply with all state regulations and local mowing ordinances.

Use equipment suitable and adequate for the mowing operation. Do not create a hazard, hindrance or delay to the public, nor damage to the roadside.

Furnish equipment in good repair and maintain to produce a neat, clean and sharp cut to the grass at all times. Do not use equipment that pulls or rips grass or otherwise damages the turf. Use equipment that can cut to 3 inches above the ground. Equip mowers with guards to prevent debris from being thrown from the cutter.

The City will not be responsible for damage to the Contractor's equipment due to obstacles encountered during the work.

Mowing equipment will include tractor drawn grass cutting equipment, and other power or hand equipment necessary to satisfactorily complete the work.

The Engineer will specify all areas to be mowed. Pick up, remove, and dispose of litter each day before cutting each area.

Hand trim, when specified, tight to all walls, fences, curbs, poles or other fixed objects within the mowing areas.

Mow landscape areas to a height of 4 inches. Cut all hand trimming at walls and curbs flush to adjacent concrete or sidewalk.

Mowing will be completed one (1) time and will be incidental to the contract. Litter, trash pickup and disposal are to be included and incidental to this item.

20. Curing Compound

All concrete shall be cured in accordance with the 2012 MDOT Standard Specifications for Construction, and as specified herein.

After texturing operations have been completed and after the free water has left the surface, coat and seal the pavement surface and sides of slip-formed pavement with a uniform layer of membrane curing compound.

Apply, not less than one gallon per 25 square yards of surface for each application. Apply the second coat after the first coat has dried sufficiently but do not exceed two hours between coats.

Keep the compound thoroughly mixed according to the manufacturer's recommendation. Do not thin curing compound.

Reapply curing compound immediately to all surfaces damaged by rain, joint sawing, Contractor's foot traffic or other activities.

If fixed-forms are removed during the curing period, coat the entire area of the sides of the pavement with curing compound immediately after removal of the forms.

It shall be the Contractor's responsibility to furnish and provision personnel to protect concrete from vandalization or damage until cured. Replacement of damaged concrete shall be determined by Engineer and replaced at no additional cost to the Owner/Project.

These requirements for curing are minimum requirements only. Repair or replacement of any concrete showing injury or damage due to inadequate curing is required. All costs associated with this work will be borne by the Contractor and included in the cost associated with the related items of work.

**THIS PROPOSAL SHALL NOT BE DETACHED FROM THESE
SPECIFICATIONS WHEN SUBMITTING BID**

BID PROPOSAL

Proposal of _____
(hereinafter called "Bidder")* a corporation, organized and existing under the laws of the State of _____
_____ a partnership, or an individual doing business as _____

To: CITY OF GRAND LEDGE
Eaton County, Michigan

Gentlemen:

The Bidder, in compliance with your Advertisement for Bids for the construction of the contract entitled, **RIVER STREET, SANITARY SEWER**, having examined the Drawings, Specifications, related documents, the site of the proposed work and being familiar with all of the conditions surrounding the construction of the proposed project including the soil and other site conditions, availability of materials and supplies, hereby propose to construct the project in accordance with the Contract Documents within the time set forth therein, and at the prices stated herein. These prices are to cover all expenses incurred in performing the work required under the Contract Documents, of which the Proposal is a part.

Bidder hereby agrees to commence work under this Contract on or before a date to be specified in written "Notice to Proceed" of the Owner and to fully complete the project in accordance with the schedule for completion as outlined in Information for Bidders. Bidder further agrees to pay as liquidated damages, the sum of \$500.00 each consecutive calendar day thereafter as hereinafter provided in the Information for Bidders.

Bidder acknowledges receipt of the following addendum:

*Insert corporation, partnership, or individual as applicable.

Bidder agrees to perform all the work described in the Contract Documents, for the following price(s):

ITEM	EST. QTY.	UNIT	DESCRIPTION	UNIT PRICE	TOTAL
City of Grand Ledge - River Street Sewer Relocation					
1	1	LSum	Temporary Bypass Pumping of Sanitary Sewer	\$	\$
2	1	Ea	Tap Existing Sanitary Manhole for 18" San. Sewer	\$	\$
3	1	Ea	Temporary Support of Power Pole	\$	\$
4	288	Lft	18" PS115 PVC Sanitary Sewer with Class "A" Backfill	\$	\$
5	1	Ea	Furnish and Install 4' Dia. Sanitary Manhole with Casting	\$	\$
6	1	Ea	Construct 8' Dia. Sanitary Manhole over existing 18" Sanitary Sewer	\$	\$
7	1	Ea	Connect Existing Force Main into new Manhole	\$	\$
8	1450	Sft	Remove and Replace Existing 4" Concrete Walk	\$	\$
9	180	Lft	Remove and Replace Existing Concrete Curb and Gutter	\$	\$
10	4100	Sft	Existing HMA Pavement Removal	\$	\$
11	450	Syd	21AA Aggregate Base (8" CIP)	\$	\$
12	75	Ton	HMA, MDOT 13A Leveling Course @ 330#/syd	\$	\$
13	150	Lft	Flowable Fill existing 18" Sanitary Sewer	\$	\$
14	2	Ea	18" Sanitary Sewer Bulkhead	\$	\$
15	6	Hours	Exploratory Digging	\$	\$
16	1	LSum	SESC Measures	\$	\$
17	1	LSum	Traffic Regulator	\$	\$
18	1	LSum	Minor Traffic Control Devices	\$	\$
19	1	LSum	Project Cleanup and Site Restoration	\$	\$
TOTAL CONSTRUCTION AMOUNT					\$

Contractors Experience Modification Rate _____
Year EMR Was Issued _____

Furnishing of the EMR is required by the City of Grand Ledge. Failure to do so will be considered as an unresponsive bid and the bid will be rejected.

Bidders shall enter amounts for ALL Bid Items.

The Bidder agrees that the above total Amount of Base Bid, (corrected for any errors in extensions or additions) shall be the basis for determination of award of this contract along with all other requirements and consideration for award as provided under Basis of Award, Information for Bidders. Bidder further agrees that final contract price will be adjusted up or down to reflect actual units constructed, furnished or placed under this Contract. Engineer shall check extensions and addition of all items.

The above prices shall include all labor, materials, removal, overhead, profit, insurance, etc. to cover the finished work of the several kinds called for.

Bidder understands that the Owner reserves the right to reject any, or all bids, and to waive any informalities in the bidding.

The Bidder agrees that this bid shall be good and may not be withdrawn for a period of SIXTY (60) calendar days after the scheduled closing time for receiving bids.

Upon receipt of written notice of the acceptance of bid, bidder will execute the formal contract attached within ten (10) days. The bid security attached in the sum of

is to become the property of the Owner in the event the Contract and Bond are not executed within the time above set forth, as liquidated damages for the delay and additional expense to the Owner caused thereby.

IN WITNESS WHEREOF, the Contractor agrees to the foregoing terms this ____ day of _____, 20__.

By: _____

Title: _____

P.O. Address: _____

Zip Code

Telephone No: _____

LEGAL STATUS OF BIDDER

The bidder shall fill out the appropriate form and strike out the other two.

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

A partnership, all of the members of which, with addresses, are:

_____	_____
_____	_____
_____	_____
_____	_____

An individual, whose signature is affixed to this proposal.

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____ as Principal, and _____ as Surety, are hereby held and firmly bound unto **City of Grand Ledge** as OWNER in the penal sum of _____ for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed, this _____ day of _____, 20_____.

The Condition of the above obligation is such that whereas the Principal has submitted to **City of Grand Ledge** a certain BID, attached hereto and hereby made a part hereof to enter into a contract in writing, for the **RIVER STREET, SANITARY SEWER**

NOW, THEREFORE

- (a) If said BID shall be rejected, or
- (b) If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attachment hereto (properly completed in accordance with said BID) and shall furnish a BOND for faithful performance of said contract, and for the payment of all persons performing labor furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said BID, then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

_____(L.S.) _____
Principal Surety

By: _____

IMPORTANT - Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.

The Surety and insurance companies providing all coverages on this Project shall have and maintain during the term of this contract a minimum A.M. Best (Best's Key Rating Guide) rating classification of "A-".

CONTRACT

THIS AGREEMENT, Entered into this _____ day of _____, 2024 by and between _____ of _____, party of the first part and hereinafter called the Contractor, and the **City of Grand Ledge**, hereinafter called the Owner, party of the second part.

WITNESSETH, That the said Contractor, for the consideration hereinafter mentioned, has agreed and does hereby agree with the said Owner that he will furnish all labor, power, materials, equipment, supplies, superintendence, Bonds, Workmen's Compensation, Public Liability and Property Damage Insurance to do and complete the work for the construction of **RIVER STREET, SANITARY SEWER** for the said Owner and that he will fully complete the same according to the Drawings and Specifications therefore and according to the proposal attached hereto and made a part of this Contract, to which reference is made for a more particular description of the work.

The Contractor agrees, as he has bid, to do said work at the prices bid in his Proposal, which price is understood to cover every contingency, the furnishing of all labor, power, materials, supplies, equipment, superintendence, complete insurance coverage, and the completion of everything connected with the construction of said **RIVER STREET, SANITARY SEWER**

The total contract price based on prices stated in the proposal and approximate quantities stated therein is _____ **Dollars and Cents, (\$ _____)**.

It is agreed between the parties, that in case the Contractor shall abandon the work to be done or shall fail to do said work, or any part thereof, according to the terms of this Contract or in case the Owner shall at any time be convinced that the work is unreasonably delayed, or that the conditions of the Contract are being willfully violated, or executed carelessly, or in bad faith, then and in such case, the Owner reserves the right to declare this Contract forfeited and to relet the unfinished portion thereof and such person or persons to whom said work shall have been relet, are hereby authorized to complete said work without hindrance from the Contractor. And the said Contractor shall be liable, in case of the non-performance of this Contract or any part thereof, and he hereby agrees to pay to the said Owner, as damages, all costs, charges and expenses attending such reletting and also such sum or sums as it shall cost to complete said Contract over and above the amounts agreed therefore.

In case of actual or alleged disagreement or discrepancy between the Contract, the Specifications and the Drawings, the language and provisions of the Contract shall take precedence and prevail. Several sections of the Contract Documents are herein listed in their order of precedence:

- (a) Contract
- (b) Bid Proposal and Addenda (as accepted in signed Contract Documents)
- (c) Information for Bidders
- (d) Special Conditions
- (e) Technical Specifications
- (f) Drawings
- (g) Standard Project Requirements

(h) General Conditions

All Contract documents herein listed, shall be binding by parties' signatory to this Contract.

The Contractor hereby agrees to commence work under this Contract on or before a date to be specified in a written "Notice to Proceed" of the Owner and to fully complete the project in accordance with the schedule for completion as outlined in Information for Bidders, "Liquidated Damages". The Contractor further agrees to pay the sum of liquidated damages, as stated in Bid Proposal Page 1, for each consecutive day thereafter as hereinafter provided in "Information to Bidders."

The Contractor hereby certifies and agrees that all construction work and all operations relating to work done under this contract by the Contractor or any subcontractor will be done in accordance with all applicable, current Federal and State laws and regulations and the Occupational Safety and Health Act. The Contractor further certifies that he will provide training and instruction on state and federal safety laws and regulations and on safe working practices to all persons involved with work under this contract.

The Contractor agrees that at his own expense, he shall protect and defend the Owner and agrees to indemnify, and save harmless the Owner for all damage, injuries, deaths, costs and expenses that may be incurred as a result of any activities of the Contractor or his subcontractors on this project.

The Contractor and the Owner mutually agree that the Owner shall have the right to reduce the scope of this work in accordance with the Bid Proposal of these Contract Documents and that such deletion, when made in writing by the Owner or his Engineer shall be by an amount which is in accordance with the Contractor's Bid Proposal.

IN WITNESS WHEREOF, the parties hereunto have set their hands and seals the day and year first above written.

CITY OF GRAND LEDGE

Owner

Contractor

By _____

By _____

_____ Title

_____ Title

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, That _____ Contractor, as principal, and _____ as surety, are held and firmly bound unto the **City of Grand Ledge** Owner, in _____ **Dollars and Cents, (\$ _____)** to be paid to the Owner for which payment well and truly to be made we jointly and severally bind ourselves, our heirs, executors, administrators, and assigns firmly by these presents.

THE CONDITIONS OF THE ABOVE OBLIGATIONS ARE such that,

WHEREAS the _____ did, on the ____ day of _____, **2024** by articles that date enter into contract with the said Owner for the construction of **RIVER STREET, SANITARY SEWER**

NOW, THEREFORE, if the said Contractor shall save and hold harmless the said Owner for all public liability and damages of every description in connection therewith, shall well and faithfully in all things fulfill the said contract according to all the conditions and stipulations therein contained in all respects, and shall save and hold harmless the said Owner from and against all liens and claims of every description in connection therewith, then this obligation shall be void and of no effect; but otherwise it shall remain in full force and virtue, and, in the event that the said Owner shall extend the time for the completion of said work or otherwise modify elements of the contract in accordance with provisions thereof, such extension of time or modification of the contract shall not in any way release the sureties of this bond.

WITNESS our hands and seals this ____ day of _____, **2024**

WITNESSES:

_____	_____ (SEAL)
_____	_____ (SEAL)
_____	Principal
_____	_____ (SEAL)
_____	_____ (SEAL)
	Surety

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENT, that we, _____ hereinafter called the Principal, and _____ hereinafter called the Surety, are held and firmly bound unto the **City of Grand Ledge** Owner, in the sum **Dollars and Cents, (\$ _____)** to the payment whereof, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these present.

Sealed with our seals and dated this ____ day of _____ A.D., **2024**.

WHEREAS, the above named Principal has entered into a certain contract with the **City of Grand Ledge**, hereinafter called the Owner, dated the ____ day of _____, A.D., **2024**. (Hereinafter called the Contract) for **RIVER STREET, SANITARY SEWER** which contract and the specifications for said work shall be deemed a part hereof as fully as if set out herein.

AND, WHEREAS, this bond is given in compliance with and subject to the provisions of Act No. 213 of the Public Acts of Michigan for the year 1963, as amended.

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION IS SUCH that if the above named Principal, legal representatives, or successors shall pay or cause to be paid to all subcontractors, persons, firms and corporations, the same may become due and payable, all indebtedness which may arise from said Principal to a subcontractor or party performing labor or furnishing materials, or any subcontractor to any person, firm, or corporation on account of any labor performed or materials furnished in connection with the contract, construction, and work herein referred to, then this obligation shall be void; otherwise to remain in full force and effect.

This bond given upon the express condition that any alterations, or modifications that may be hereafter recorded or made in the construction and complete installation of the work here referred to, or the placing of an inspector or superintendent thereon by the Owner shall not operate to discharge or release the sureties thereon.

IN WITNESS THEREOF, the parties hereto have caused this instrument to be executed by their respective authorized officers this ____ day of _____, A.D., **2024**.

_____(Seal)
Principal
_____(Seal)
Surety

Signed, sealed and delivered in the presence of:

Bonds correct in form: _____ Attorney

MAINTENANCE AND GUARANTEE BOND

KNOW ALL MEN BY THESE PRESENT, that _____, Contractor, as principal and _____, as surety, are held and firmly bound unto **City of Grand Ledge** Owner, in the sum of _____ **Dollars and Cents, (\$ _____)** to be paid to said Owner, its legal representative and assigns, for which payment will and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns and each and every one of them jointly and firmly by these present.

Sealed with our seals and dated the ____ day of _____, 2024.

WHEREAS, the above-named principal has entered into a certain written contract with **City of Grand Ledge**, dated this ____ day of _____, 2024, wherein the principal agreed as follows:

RIVER STREET, SANITARY SEWER

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that by and under said contract, the above-named principal has agreed with said Owner for a period of one (1) year from the date of the payment of the final estimate and for such new guarantee periods as may be required pursuant to the Special Project Conditions, General Conditions, to keep in good order and repair any defect in all the work done under said contract either by the Principal or his subcontractors, or his material suppliers, that may develop during said period due to improper materials, defective equipment, workmanship or arrangements, and any other work affected in making good such imperfections, shall also be made good, all without expense to the Owner, excepting only such part or parts of said work as may have been disturbed without the consent or approval of the Principal after the final acceptance of the work and that whenever directed so to do by the Owner, by notice served in writing, either personally or by mail, on the Principal at _____

_____ or _____ legal representative, or successors, or on the Surety at _____ he will proceed at once to make such repairs as directed by said Owner; and in case of failure so to do within one (1) week from the date of service of such notice, or within reasonable time, not less than one (1) week, as shall be fixed in said notice, then the said Owner shall have the right to purchase such materials and employ such labor and equipment as may be necessary for the purpose and to undertake to do and make such repairs and charge the expense thereof to and receive same from said Principal or Surety. If any repair is necessary to be made at once to protect life and property, then and in that case, the said Owner may take immediate steps to repair or barricade such defects without notice to the Contractor. In such accounting the Owner shall not be held to obtain the lowest figure for doing of the work or any part thereof, but all sums actually paid therefore shall be charged to the Principal or Surety. In this connection the judgment of the Owner is final and conclusive. If the said Principal for a period of one (1) year from the date of the final estimate payment shall keep such work so constructed under the contract in good order and repair, excepting only such part or parts of such work as may have been disturbed without the consent or approval of said Principal after the final acceptance of the same and shall, whenever notice is given as hereinbefore specified, at once proceed to make repair as in said notice directed or shall reimburse said Owner for any expense incurred by making such repairs, should the Principal or Surety fail to do as

hereinbefore specified and shall fully indemnify, defend and save harmless the said Owner from all suits and actions for damages of every name and description brought or claimed against it for or on account of any injury to person or property received or sustained by any party or parties, by or from any of the acts or omissions or through the negligence of said Principal, servants or employees, in the prosecution of the work included in said contract and from any and all claims arising under the Workmen's Compensation Act, so called, of the State of Michigan, then the above obligation shall be void, otherwise to remain in full force and effect.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed by their respective authorized officers this ____ day of, _____ **2024**.

Signed, Sealed and delivered
in the presence of:

_____	_____ (L.S.)
_____	_____ (L.S.)
_____	_____ (L.S.)

NOTICE OF AWARD

TO: _____

Date: _____

PROJECT Description: **RIVER STREET, SANITARY SEWER**

The OWNER has considered the BID submitted by you for the above described WORK in response to its Advertisement for Bids dated _____, **2024**, and Information for Bidders.

You are hereby notified that your BID has been accepted for items in the amount of \$_____.

You are required by the Information for Bidders to execute the Contract and furnish the required CONTRACTOR'S Performance BOND, Payment BOND, Maintenance and Guarantee Bond and certificates of insurance within ten (10) calendar days from the date of this Notice to you.

If you fail to execute said Contract and to furnish said BONDS within ten (10) days from the date of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER'S acceptance of your BID as abandoned and as a forfeiture of your BID BOND. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the Owner.

Dated this ___ day of _____, **2024**

CITY OF GRAND LEDGE

Owner

By: _____

Title: _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged

By: _____ this the ___ day of _____, **2024**.

By: _____ Title: _____

NOTICE TO PROCEED

TO: _____

DATE: _____

PROJECT: **RIVER STREET, SANITARY SEWER**

You are hereby notified to commence WORK in accordance with the Contract dated _____, **2024** on or before _____, **2024**, and you are to complete the WORK within **30 consecutive** calendar days thereafter. The date of completion of all WORK is therefore _____, **2024**.

CITY OF GRAND LEDGE
Owner

By: _____

Title: _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by _____ this the _____ day of _____, **2024**.

By: _____

Title: _____

Employer Identification
Number: _____

**CONSENT OF SURETY
For Final Payment**

PROJECT NAME: RIVER STREET, SANITARY SEWER

OWNER: City of Grand Ledge

PROJECT NO.: 23-0049

AMOUNT OF CONTRACT: _____

In accordance with the provisions of the above-named contract between the Owner and the Contractor, the following named surety:

on the Payment Bond of the following-named Contractor:

hereby approves of final payment to the Contractor, and further agrees that said final payment to the Contractor shall not relieve the Surety Company named herein of any of its obligations to the Owner as set forth in said Surety company's bond.

IN WITNESS WHEREOF, the Surety Company has hereunto set its hand and seal this _____ day of _____ 20, _____.

(Name of Surety Company)

(Signature of Authorized Representative)

TITLE: _____

(Corporation Seal)

CONTRACTS FOR IMPROVEMENT TO REAL PROPERTY
Act 57 of 1998

AN ACT to require contractors to provide certain notices to governmental entities concerning improvements on real property; to allow for the modification of contracts for improvement to real property; to provide for remedies; and to repeal acts and parts of acts.

History: 1998, Act 57, Eff. Oct. 6, 1998.

The People of the State of Michigan enact:

125.1591 Definitions.

Sec. 1. As used in this act:

(a) "Contractor" means a person who contracts with a governmental entity to improve real property or perform or manage construction services. Contractor does not include a person licensed under article 20 of the occupational code, 1980 PA 299, MCL 339.2001 to 339.2014.

(b) "Governmental entity" means the state, a county, city, township, village, public educational institution, or any political subdivision thereof.

(c) "Improve" means to build, alter, repair, or demolish an improvement upon, connected with, or beneath the surface of any real property, to excavate, clear, grade, fill, or landscape any real property, to construct driveways and roadways, or to perform labor upon improvements.

(d) "Improvement" includes, but is not limited to, all or any part of any building, structure, erection, alteration, demolition, excavation, clearing, grading, filling, landscaping, trees, shrubbery, driveways, and roadways on real property.

(e) "Person" means an individual, corporation, partnership, association, governmental entity, or any other legal entity.

(f) "Real property" means the real estate that is improved, including, but not limited to, lands, leaseholds, tenements, hereditaments, and improvements placed on the real property.

History: 1998, Act 57, Eff. Oct. 6, 1998.

125.1592 Improvement contract exceeding \$75,000; provisions.

Sec. 2. A contract between a contractor and a governmental entity for an improvement that exceeds \$75,000.00 shall contain all of the following provisions:

(a) That if a contractor discovers 1 or both of the following physical conditions of the surface or subsurface at the improvement site, before disturbing the physical condition, the contractor shall promptly notify the governmental entity of the physical condition in writing:

(i) A subsurface or a latent physical condition at the site is differing materially from those indicated in the improvement contract.

(ii) An unknown physical condition at the site is of an unusual nature differing materially from those ordinarily encountered and generally recognized as inhering in work of the character provided for in the improvement contract.

(b) That if the governmental entity receives a notice under subdivision (a), the governmental entity shall promptly investigate the physical condition.

(c) That if the governmental entity determines that the physical conditions do materially differ and will cause an increase or decrease in costs or additional time needed to perform the contract, the governmental entity's determination shall be made in writing and an equitable adjustment shall be made and the contract modified in writing accordingly.

(d) That the contractor cannot make a claim for additional costs or time because of a physical condition unless the contractor has complied with the notice requirements of subdivision (a). The governmental entity may extend the time required for notice under subdivision (a).

(e) That the contractor cannot make a claim for an adjustment under the contract after the contractor has received the final payment under the contract.

History: 1998, Act 57, Eff. Oct. 6, 1998.

125.1593 Contract completion; performance; consent of governmental entity; arbitration; judgment rendered.

Sec. 3. (1) If the contractor does not agree with the governmental entity's determination, with the governmental entity's consent the contractor may complete performance on the contract.

(2) At the option of the governmental entity, the contractor and the governmental entity shall arbitrate the contractor's entitlement to recover the actual increase in contract time and costs incurred because of the physical condition of the improvement site. The arbitration shall be conducted in accordance with the rules of the American arbitration association and judgment rendered may be entered in any court having jurisdiction.

History: 1998, Act 57, Eff. Oct. 6, 1998.

125.1594 Incorporation of additional provisions.

Sec. 4. If an improvement contract does not contain the provisions required under section 2, the provisions shall be incorporated into and considered part of the improvement contract.

History: 1998, Act 57, Eff. Oct. 6, 1998.

125.1595 Rights or remedies.

Sec. 5. This act does not limit the rights or remedies otherwise available to a contractor or the governmental entity under any other law or statute.

History: 1998, Act 57, Eff. Oct. 6, 1998.

125.1596 Repealed. 2001, Act 28, Imd. Eff. June 22, 2001.

Compiler's note: The repealed section pertained to repeal of act.

Act No. 524
Public Acts of 1980
Approved by Governor
January 29, 1981

PAYMENT TO CONTRACTORS

**STATE OF MICHIGAN
80TH LEGISLATURE
REGULAR SESSION OF 1980**

Introduced by Rep. Ryan

ENROLLED HOUSE BILL NO. 5541

An ACT to provide for the terms of certain construction contracts with certain public agencies; to regulate the payment and retainage of payments on construction contracts with certain public agencies; and to provide for the resolution of certain disputes.

The People of the State of Michigan enact:

Sec. 1. As used in this act:

(a) "Agent" means the person or persons agreed to or selected by the contractor and the public agency pursuant to section 4(2).

(b) "Architect or professional engineer" means an architect or professional engineer licensed under Act No. 299 of the Public Acts of 1980, being sections 339.101 to 339.2601 of the Michigan Compiled Laws, and designated by a public agency in a construction contract to recommend progress payments.

(c) "Construction contract" or "contract" means a written agreement between a contractor and a public agency for the construction, alteration, demolition, or repair of a facility, other than a contract having a dollar value of less than \$30,000.00 or a contract that provides for 3 or fewer payments.

(d) "Contract documents" means the construction contract; instructions to bidders; proposal; conditions of the contract; performance bond; labor and material bond; drawings; specifications; all addenda issued before execution of the construction contract and all modifications issued subsequently.

(e) "Contractor" means an individual, sole proprietorship, partnership, corporation, or joint venture, that is a party to a construction contract with a public agency.

(f) "Facility" means a building, utility, road, street, boulevard, parkway, bridge, ditch, drain, levee, dike, sewer, park, playground, or other structure or work that is paid for with public funds or a special assessment.

(g) "Progress payment" means a payment by a public agency to a contractor for work in place under the terms of a construction contract.

(h) "Public agency" means this state, or a county, city, township, village, assessment district, or other political subdivision, corporation, commission, agency, or authority created by law. However, public agency does not include the state transportation department, a school district, junior or community college, the Michigan state housing development authority created in Act No. 346 of the Public Acts of 1966, as amended,

being sections 125.1401 to 125.1496 of the Michigan Compiled Laws and a municipal electric utility or agency. "Assessment district" means the real property within a distinct area upon which special assessments are levied or imposed for the construction, reconstruction, betterment, replacement, or repair of a facility

to be paid for by funds derived from those special assessments imposed or levied on the benefitted real property.

(1) “Retainage” or “retained funds” means the amount withheld from a progress payment to a contractor pursuant to section 3.

Sec. 2. (1) The construction contract shall designate a person representing the contractor who will submit written requests for progress payments, and a person representing the public agency to whom requests for progress payments are to be submitted. The written requests for progress payments shall be submitted to the designated person in a manner and at such times as provided in the construction contract.

(2) The processing of progress payments by the public agency may be deferred by the public agency until work having a prior sequence, as provided in the contract documents, is in place and is approved.

(3) Each progress payment requested, including reasonable interest if requested under subsection (4) shall be paid within 1 of the following time periods, whichever is later:

(a) Thirty days after the architect or professional engineer has certified to the public agency that work is in place in the portion of the facility covered by the applicable request for payment in accordance with the contract documents.

(b) Fifteen days after the public agency 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 are to come from either of those sources.

(4) Upon failure of a public agency to make a timely progress payment pursuant to this section, the person designated to submit requests for progress payments may include reasonable interest on amounts past due in the next request for payment.

Sec. 3. (1) To assure proper performance of a construction contract by the contractor, a public agency may retain a portion of each progress payment otherwise due as provided in this section.

(2) The retainage shall be limited to the following:

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

(b) After the work is 50% in place, additional retainage shall not be withheld unless the public agency determines that the contractor is not making satisfactory progress, or for other specific cause relating to the contractor’s performance under the contract. If the public agency so determines, the public agency may retain not more than 10% of the dollar value of work more than 50% in place.

(3) The retained funds shall not exceed the pro rata share of the public agency’s matching requirement under the construction contract and shall not be commingled with other funds of the public agency and shall be deposited in an interest-bearing account in a regulated financial institution in this state wherein all such retained funds are kept by the public agency which shall account for both retainage and interest on each construction contract separately. A public agency is not required to deposit retained funds in an interest-bearing account if the retained funds are to be provided under a state or federal grant and the retained funds have not been paid to the public agency.

(4) Except as provided in section 4(7) and (8), retainage and interest earned on retainage shall be released to a contractor together with the final progress payment.

(5) At any time after 94% of work under the contract is in place and at the request of the original contractor, the public agency shall release the retainage plus interest to the original contractor only if the original contractor provides to the public agency an irrevocable letter of credit in the amount of the retainage plus interest, issued by a bank authorized to do business in this state, containing terms mutually acceptable to the contractor and the public agency.

Sec. 4. (1) The construction contract shall contain an agreement to submit those matters described in subsection (3) to the decision of an agent at the option of the public agency.

(2) If a dispute regarding a matter described in subsection (3) arises, the contractor and the public agency shall designate an agent who has background, training, and experience in the construction of facilities similar to that which is the subject of the contract, as follows:

(a) In an agreement reached within 10 days after a dispute arises.

(b) If an agreement cannot be reached within 10 days after a dispute arises, the public agency shall designate an agent who has background, training, and experience in the construction of facilities similar to that which is the subject of the contract and who is not an employee of the agency.

(3) The public agency may request dispute resolution by the agent regarding the following:

(a) At any time during the term of the contract, to determine whether there has been a delay for reasons that were within the control of the contractor, and the period of time that delay has been caused, continued, or aggravated by actions of the contractor.

(b) At any time after 94% of work under the contract is in place, whether there has been an unacceptable delay by the contractor in performance of the remaining 6% of work under the contract. The agent shall consider the terms of the contract and the procedures normally followed in the industry and shall determine whether the delay was for failure to follow reasonable and prudent practices in the industry for completion of the project.

(4) This dispute resolution process shall be used only for the purpose of determining the rights of the parties to retained funds and interest earned on retained funds and is not intended to alter, abrogate, or limit any rights with respect to remedies that are available to enforce or compel performance of the terms of the contract by either party.

(5) The agent may request and shall receive all pertinent information from the parties and shall provide an opportunity for an informal meeting to receive comments, documents, and other relevant information in order to resolve the dispute. The agent shall determine the time, place, and procedure for the informal meeting. A written decision and reasons for the decision shall be given to the parties within 14 days after the meeting.

(6) The decision of the agent shall be final and binding upon all parties. Upon application of either party, the decision of the agent may be vacated by order of the circuit court only upon a finding by the court that the decision was procured by fraud, duress, or other illegal means.

(7) If the dispute resolution results in a decision:

(a) That there has been a delay as described in subsection (3)(a), all interested earned on retained funds during the period of delay shall become the property of the public agency.

(b) That there has been unacceptable delay as described in subsection (3)(b), the public agency may contract with a subsequent contractor to complete the remaining 6% of work under the contract, and interest earned on retained funds shall become the property of the public agency. A subsequent contractor under this subdivision shall be paid by the public agency from the following sources until each source is depleted, in the order listed below:

(i) The dollar value of the original contract, less the dollar value of funds already paid to the original contractor and the dollar value of work in place for which the original contractor has not received payment.

(ii) Retainage from the original contractor, or funds made available under a letter of credit provided under section 3(5).

(iii) Interest earned on retainage from the original contractor, or funds made available under a letter of credit provided under section 3(5).

(8) If the public agency contracts with a subsequent contractor as provided in subsection (7)(b), the final progress payment shall be payable to the original contractor within the time period specified in section 2(3). The amount of the final progress payment to the original contractor shall not include interest earned on retained funds. The public agency may deduct from the final progress payment all expenses of contracting with the subsequent contractor. This act shall not impair the right of the public agency to bring an action or to otherwise enforce a performance

bond to complete work under a construction contract.

Sec.5. (1) Except as provided in subsection (2), this act shall apply only to a construction contract entered into after the effective date of this act.

(2) For a construction contract entered into before the effective date of this act, the provisions of this act may be implemented by a public agency, through a contract amendment, upon the written request of the contractor, with such consideration as the public considers adequate.

Sec.6. This act shall take effect January 1, 1983.

GENERAL CONDITIONS

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1. DEFINITIONS

- 1.1 Wherever used in the CONTRACT DOCUMENTS, the following terms shall have the meanings indicated and shall be applicable to both the singular and plural thereof:
- 1.2 ADDENDA - Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the CONTRACT DOCUMENTS, DRAWINGS, and SPECIFICATIONS, by additions, deletions, clarifications or corrections.
- 1.3 BID - The offer or proposal of the BIDDER submitted on the prescribed form setting forth the prices for the WORK to be performed.
- 1.4 BIDDER - Any person, firm or corporation submitting a BID for the WORK.
- 1.5 BONDS - Bid Bond, Performance, Payment and Maintenance and Guarantee Bonds and other instruments of surety, furnished by the CONTRACTOR and the CONTRACTOR'S surety in accordance with the CONTRACT DOCUMENTS.

- 1.6 CHANGE ORDER - A written order to the CONTRACTOR authorizing an addition, deletion, or revision in the WORK within the general scope of the CONTRACT DOCUMENTS or authorizing an adjustment in the CONTRACT PRICE or CONTRACT TIME.
- 1.7 CONTRACT DOCUMENTS - The CONTRACT, including ADVERTISEMENT FOR BIDS, INFORMATION FOR BIDDERS, PROPOSAL, BID BOND, CONTRACT, PAYMENT BOND, PERFORMANCE BOND, MAINTENANCE AND GUARANTEE BOND, NOTICE OF AWARD, NOTICE TO PROCEED, CHANGE ORDER, DRAWINGS, SPECIFICATIONS, and ADDENDA.
- 1.8 CONTRACT PRICE - The total monies payable to the CONTRACTOR under the terms and conditions of the CONTRACT DOCUMENTS.
- 1.9 CONTRACT TIME - The number of calendar days stated in the CONTRACT DOCUMENTS for the completion of the WORK.
- 1.10 CONTRACTOR - The person, firm, or corporation with whom the OWNER has executed the Agreement.
- 1.11 DRAWINGS - The parts of the CONTRACT DOCUMENTS which show the characteristics and scope of the WORK to be performed and which have been prepared or approved by the ENGINEER.
- 1.12 ENGINEER - The person, firm, or corporation named as such in the CONTRACT DOCUMENTS.
- 1.13 FIELD ORDER - A written order effecting a change in the WORK not involving an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, issued by the ENGINEER to the CONTRACTOR during construction.
- 1.14 NOTICE OF AWARD - The written notice of the acceptance of the BID from the OWNER to the successful BIDDER.
- 1.15 NOTICE TO PROCEED - Written communication issued by the OWNER to the CONTRACTOR authorizing him/her to proceed with the WORK and establishing the date for commencement of the WORK.
- 1.16 OWNER - A public or quasi-public body or authority, corporation, association, partnership, or an individual for whom the WORK is to be performed.
- 1.17 PROJECT - The undertaking to be performed as provided in the CONTRACT DOCUMENTS.

- 1.18 RESIDENT PROJECT REPRESENTATIVE - The authorized representative of the OWNER who is assigned to the PROJECT site or any part thereof.
- 1.19 SHOP DRAWINGS - All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the CONTRACTOR, or SUBCONTRACTOR, manufacturer, SUPPLIER or distributor, which illustrate how specific portions of the WORK shall be fabricated or installed.
- 1.20 SPECIFICATIONS - A part of the CONTRACT DOCUMENTS consisting of written descriptions of a technical nature of materials, equipment, construction systems, standard and workmanship.
- 1.21 SUBCONTRACTOR - An individual, firm or corporation having a direct contact with CONTRACTOR or with any other SUBCONTRACTOR for the performance of a part of the WORK at the site.
- 1.22 SUBSTANTIAL COMPLETION - That date certified by the ENGINEER when the construction of the PROJECT or a specified part thereof is sufficiently completed, in accordance with the CONTRACT DOCUMENTS, so that the PROJECT or specified part can be utilized for the purposes for which it is intended.
- 1.23 SUPPLEMENTAL GENERAL CONDITIONS - Modifications to General Conditions required by a Federal agency for participation in the PROJECT and approved by the agency in writing prior to inclusion in the CONTRACT DOCUMENTS, or such requirements that may be imposed by applicable state laws.
- 1.24 SUPPLIER - Any person or organization who supplies materials or equipment for the WORK, including that fabricated to a special design, but who does not perform labor at the site.
- 1.25 WORK - All labor necessary to produce the construction required by the CONTRACT DOCUMENTS, and all materials and equipment incorporated or to be incorporated in the PROJECT.
- 1.26 WRITTEN NOTICE - Any notice to any party of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at their last given address or delivered in person to said party to their authorized representative on the WORK.

2. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

- 2.1 The CONTRACTOR may be furnished additional instructions and detail drawings, by the ENGINEER, as necessary to carry out the WORK required by the CONTRACT DOCUMENTS.
- 2.2 The additional drawings and instructions thus supplied will become a part of the CONTRACT DOCUMENTS. The CONTRACTOR shall carry out the WORK in accordance with the additional detail drawings and instructions.

3. SCHEDULES, REPORTS AND RECORDS

- 3.1 The CONTRACTOR shall submit to the OWNER such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data where applicable as are required by the CONTRACT DOCUMENTS for the WORK to be performed.
- 3.2 Prior to the first partial payment estimate the CONTRACTOR shall submit construction progress schedules showing the order in which the CONTRACTOR proposes to carry on the WORK, including dates at which the various parts of the WORK will be started, estimated date of completion at each part and, as applicable:
 - 3.2.1 The dates at which special drawings will be required; and
 - 3.2.2 Respective dates for submission of SHOP DRAWINGS, the beginning of manufacture, the testing and the installation of materials, supplies and equipment.
- 3.3 The CONTRACTOR shall also submit a schedule of payments that the CONTRACTOR anticipates will be earned during the course of the WORK.

4. DRAWINGS AND SPECIFICATIONS

- 4.1 The intent of the DRAWINGS and SPECIFICATIONS is that the CONTRACTOR shall furnish all labor, materials, tools, equipment and transportation necessary for the proper execution of the WORK in accordance with the CONTRACT DOCUMENTS and all incidental work necessary to complete the PROJECT in an acceptable manner, ready for use, occupancy or operation by the OWNER.
- 4.2 In case of conflict between the DRAWINGS and SPECIFICATIONS, refer to Contract. Figure dimensions on DRAWINGS shall govern over general DRAWINGS.

- 4.3 Any discrepancies found between the DRAWINGS and SPECIFICATIONS and site conditions or any inconsistencies or ambiguities in the DRAWINGS or SPECIFICATIONS shall be immediately reported to the ENGINEER, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. WORK done by the CONTRACTOR after discovery of such discrepancies, inconsistencies or ambiguities shall be done at the CONTRACTOR'S risk.

5. SHOP DRAWINGS

- 5.1 The CONTRACTOR shall provide SHOP DRAWINGS as may be necessary for the prosecution of the WORK as required by the CONTRACT DOCUMENTS. The ENGINEER shall promptly review all SHOP DRAWINGS. The ENGINEER'S approval of any SHOP DRAWING shall not release the CONTRACTOR from responsibility for deviations from the CONTRACT DOCUMENTS. The approval of any SHOP DRAWING which substantially deviates from the requirement of the CONTRACT DOCUMENTS shall be evidenced by a CHANGE ORDER.
- 5.2 When submitted for the ENGINEER'S review, SHOP DRAWINGS shall bear the CONTRACTOR'S certification that he has reviewed, check and approved the SHOP DRAWINGS and that they are in conformance with the requirements of the CONTRACT DOCUMENTS.
- 5.3 Portions of the WORK requiring a SHOP DRAWING or sample submission shall not begin until the SHOP DRAWING or submission has been approved by the ENGINEER. A copy of each approved SHOP DRAWING and each approved sample shall be kept in good order by the CONTRACTOR at the site and shall be available to the ENGINEER.

6. MATERIALS, SERVICES AND FACILITIES

- 6.1 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, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete and deliver the WORK within the specified time.
- 6.2 Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the WORK. Stored materials and equipment to be incorporated in the WORK shall be located so as to facilitate prompt inspection.

- 6.3 Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.
- 6.4 Materials, supplies, and equipment shall be in accordance with samples submitted by the CONTRACTOR and approved by the ENGINEER.
- 6.5 Materials, supplies, or equipment to be incorporated into the WORK shall not be purchased by the CONTRACTOR or the SUBCONTRACTOR subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.

7. **INSPECTION AND TESTING**

- 7.1 All materials and equipment used in the construction of the PROJECT shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the CONTRACT DOCUMENTS.
- 7.2 The OWNER shall provide all inspection and testing services not required by the CONTRACT DOCUMENTS.
- 7.3 The CONTRACTOR shall provide at the CONTRACTOR'S expense the testing and inspection services required by the CONTRACT DOCUMENTS.
- 7.4 If the CONTRACT DOCUMENTS, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any WORK to specifically be inspected, tested, or approved by someone other than the CONTRACTOR, the CONTRACTOR will give the ENGINEER timely notice of readiness. The CONTRACTOR will then furnish the ENGINEER the required certificates of inspection, testing or approval.
- 7.5 Inspections, tests, or approvals by the ENGINEER or others shall not relieve the CONTRACTOR from the obligations to perform the WORK in accordance with the requirements of the CONTRACT DOCUMENTS.
- 7.6 The ENGINEER and the ENGINEER'S representatives will at all times have access to the WORK. In addition, authorized representatives and agents of any participating Federal or State agency shall be permitted to inspect all work, materials, payrolls, records or personnel, invoices of materials, and other relevant data and records. The CONTRACTOR will provide proper facilities for such access and observation of the WORK and also for any inspection or testing thereof.

- 7.7 If any WORK is covered contrary to the written instructions of the ENGINEER it must, if required by the ENGINEER, be uncovered for the ENGINEER'S observation and replaced at the CONTRACTOR'S expense.
- 7.8 If the ENGINEER considers it necessary or advisable that covered WORK be inspected or tested by others, the CONTRACTOR, at the ENGINEER'S request, will uncover, expose or otherwise make available for observation, inspection or testing as the ENGINEER may require, that portion of the WORK in question, furnishing all necessary labor, materials, tools and equipment. If it is found that such WORK is defective, the CONTRACTOR will bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, if, however, such WORK is not found to be defective, the CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction and an appropriate CHANGE ORDER shall be issued.

8. **SUBSTITUTIONS**

- 8.1 Whenever a material, article, or piece of equipment is identified on the DRAWINGS or SPECIFICATIONS by reference to brand name or catalogue numbers, it shall be understood that this is referenced for the purpose of defining the performance or other salient requirements and that other products of equivalent capacities, quality and function shall be considered. The CONTRACTOR may recommend the substitution of a material, article, or piece of equipment of equivalent substance and function for those referred to in the CONTRACT DOCUMENT by reference to brand name or catalogue number, and if, in the opinion of the ENGINEER, such material, article, or piece of equipment is of equivalent substance and function to that specified, the ENGINEER may approve its substitution and use by the CONTRACTOR. Any cost differential shall be deductible from the CONTRACT PRICE and the CONTRACT DOCUMENTS shall be appropriately modified by CHANGE ORDER. The CONTRACTOR warrants that if substitutes are approved, no major changes in the function or general design of the PROJECT will result. Incidental changes or extra component parts required to accommodate the substitute will be made by the CONTRACTOR without a change in the CONTRACT PRICE or CONTRACT TIME.

9. **PATENTS**

- 9.1 The CONTRACTOR shall pay all applicable royalties and license fees, and shall defend all suits or claims for infringement of any patent rights and save the OWNER harmless from loss or account thereof, except that the OWNER shall be

responsible for any such loss when a particular process, design, or product of a particular manufacturer or manufacturers is specified, however, if the CONTRACTOR has reason to believe that the design, process or product specified is an infringement of a patent, the CONTRACTOR shall be responsible for such loss unless the CONTRACTOR promptly gives such information to the ENGINEER.

10. **SURVEYS, PERMITS, REGULATIONS**

- 10.1 The OWNER shall furnish all boundary surveys and establish all base lines for locating the principal component parts of the WORK together with a suitable number of bench marks adjacent to the WORK as shown in the CONTRACT DOCUMENTS. From the information provided by the OWNER, unless otherwise specified in the CONTRACT DOCUMENTS, the CONTRACTOR shall develop and make all detail surveys needed for construction such as slope stakes, batter boards, stakes for pipe locations and other working points, lines, elevations and cut sheets.
- 10.2 The CONTRACTOR shall carefully preserve bench marks, reference points and stakes and, in case of willful or careless destruction, shall be charged with the resulting expense and shall be responsible for any mistake that may be caused by their unnecessary loss or disturbance.
- 10.3 Permits and licenses of a temporary nature necessary for the prosecution of the WORK shall be secured and paid for by the CONTRACTOR unless otherwise stated in the SUPPLEMENTAL GENERAL CONDITIONS (SPECIAL CONDITIONS). Permits, licenses and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the OWNER, unless otherwise specified. The CONTRACTOR shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the WORK as drawn and specified. If the CONTRACTOR observes that the CONTRACT DOCUMENTS are at variance therewith, the CONTRACTOR shall promptly notify the ENGINEER in writing, and any necessary changes shall be adjusted as provided in Section 13, CHANGES IN THE WORK.

11. **PROTECTION OF WORK, PROPERTY AND PERSONS**

- 11.1 The CONTRACTOR will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the WORK. The CONTRACTOR will take all necessary precautions for the safety of, will provide the necessary precautions for the safety of, and will provide the necessary protection to prevent damage, injury or loss of all employees on the

WORK and other persons who may be affected thereby, all the WORK and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

- 11.2 The CONTRACTOR will comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. The CONTRACTOR will erect and maintain, as required by the conditions and progress of the WORK, all necessary safeguards for safety and protection. The CONTRACTOR will notify owners of adjacent utilities when prosecution of the WORK may affect them. The CONTRACTOR will remedy all damage, injury or loss to any property caused, directly or indirectly, in whole or part, by the CONTRACTOR, any SUBCONTRACTOR or anyone directly or indirectly employed by any of them or anyone of whose acts any of them be liable, except damage or loss attributable to the fault of the CONTRACT DOCUMENTS or to the acts or omissions of the OWNER, of the ENGINEER or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the CONTRACTOR.
- 11.3 In emergencies affecting the safety of persons or the WORK or property at the site or adjacent thereof, the CONTRACTOR, without special instructions or authorization from the ENGINEER or OWNER, shall act to prevent threatened damage, injury or loss. The CONTRACTOR will give the ENGINEER prompt WRITTEN NOTICE of any significant changes in the WORK or deviations from the CONTRACT DOCUMENTS caused thereby, and a CHANGE ORDER shall thereupon be issued covering the changes and deviations involved.

12. SUPERVISION BY CONTRACTOR

- 12.1 The CONTRACTOR will supervise and direct the WORK. He will be solely responsible for the means, methods, techniques, sequences and procedures of construction. The CONTRACTOR will employ and maintain on the WORK a qualified supervisor or superintendent who shall have been designated in writing by the CONTRACTOR as the CONTRACTOR'S representative at the site. The supervisor shall have full authority to act on behalf of the CONTRACTOR and all communications given to the supervisor shall be as binding as if given to the CONTRACTOR. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the WORK.

13. CHANGES IN THE WORK

- 13.1 The OWNER may at any time, as the need arises, order changes within the scope of the WORK without invalidating the Agreement. If such changes increase or decrease the amount due under the CONTRACT DOCUMENTS, or in the time required for performance of the WORK, an equitable adjustment shall be authorized by CHANGE ORDER.
- 13.2 The ENGINEER, also, may at any time, by issuing a FIELD ORDER, make changes in the details of the WORK. The CONTRACTOR shall proceed with the performance of any changes in the WORK so ordered by the ENGINEER unless the CONTRACTOR believes that such FIELD ORDER entitles the CONTRACTOR to a change in CONTRACT PRICE or TIME, or both, in which event the CONTRACTOR shall give the ENGINEER WRITTEN NOTICE thereof within seven (7) days after the receipt of the ordered change. Thereafter the CONTRACTOR shall document the basis for the change in CONTRACT PRICE or TIME within thirty (30) days. The CONTRACTOR shall not execute such changes pending the receipt of an executed CHANGE ORDER or further instruction from the OWNER.

14. CHANGES IN CONTRACT PRICE

- 14.1 The CONTRACT PRICE may be changed only by a CHANGE ORDER. The value of any WORK covered by a CHANGE ORDER or of any claim for increase or decrease in the CONTRACT PRICE shall be determined by one or more of the following methods in the order of precedence listed below:
- a. Unit prices previously approved.
 - b. An agreed lump sum.

15. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

- 15.1 The date of beginning and the time for completion of the WORK are essential conditions of the CONTRACT DOCUMENTS and the WORK embraced shall be commenced on a date specified in the NOTICE TO PROCEED.
- 15.2 The CONTRACTOR will proceed with the WORK at such rate of progress to insure full completion within the CONTRACT TIME. It is expressly understood and agreed, by and between the CONTRACTOR and the OWNER, that the CONTRACT TIME for the completion of the WORK described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the WORK.

15.3 If the CONTRACTOR shall fail to complete the WORK within the CONTRACT TIME, or extension of time granted by the OWNER, then the CONTRACTOR will pay to the OWNER the amount for liquidated damages as specified in the BID for each calendar day that the CONTRACTOR shall be in default after the time stipulated in the CONTRACT DOCUMENTS.

15.4 The CONTRACTOR shall not be charged with liquidated damages or any excess cost, and shall not be entitled to additional payment, when the delay in completion of the WORK is due to the following and the CONTRACTOR has promptly given WRITTEN NOTICE of such delay to the OWNER or ENGINEER.

15.4.1 To any preference, priority, or allocation order duly issued by the OWNER.

15.4.2 To unforeseeable causes beyond the 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, acts of another CONTRACTOR in the performance of a contract with the OWNER, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather; and

15.4.3 To any delays of SUBCONTRACTORS occasioned by any of the causes specified in paragraph 15.4.1 and 15.4.2 of this article.

16. **CORRECTION OF WORK**

16.1 The CONTRACTOR shall promptly remove from the premises all WORK rejected by the ENGINEER for failure to comply with the CONTRACT DOCUMENTS, whether incorporated in the construction or not, and the CONTRACTOR shall promptly replace and reexecute the WORK in accordance with the CONTRACT DOCUMENTS and without expense to the OWNER and shall bear the expense of making good all WORK of other CONTRACTORS destroyed or damaged by such removal or replacement.

16.2 All removal and replacement WORK shall be done at the CONTRACTOR'S expense. If the CONTRACTOR does not take action to remove such rejected WORK within ten (10) days after receipt of WRITTEN NOTICE, the OWNER may remove such WORK and store the materials at the expense of the CONTRACTOR.

17. **SUBSURFACE CONDITIONS**

- 17.1 The CONTRACTOR shall promptly, and before such conditions are disturbed, except in the event of an emergency, notify the OWNER by WRITTEN NOTICE of:
- 17.1.1 Subsurface or latent physical conditions at the site differing materially from those indicated in the CONTRACT DOCUMENTS; or
- 17.1.2 Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in WORK of the character provided for in the CONTRACT DOCUMENTS.
- 17.2 The OWNER shall promptly investigate the conditions, and if it is found that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the WORK, an equitable adjustment shall be made, and the CONTRACT DOCUMENTS shall be modified by a CHANGE ORDER. Any claim to the CONTRACTOR for adjustment hereunder shall not be allowed unless the required WRITTEN NOTICE has been given; provided that the OWNER may, if the OWNER determines the facts so justify, consider and adjust any such claims asserted before the date of final payment.

18. SUSPENSION OF WORK, TERMINATION AND DELAY

- 18.1 The OWNER may suspend the WORK or any portion thereof for a period of not more than ninety days or such further time as agreed upon by the CONTRACTOR by WRITTEN NOTICE to the CONTRACTOR and the ENGINEER which shall fix the date on which WORK shall be resumed. The CONTRACTOR will resume that WORK on the date so fixed. The CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to any suspension.
- 18.2 If the CONTRACTOR is adjudged bankrupt or insolvent, or makes a general assignment for the benefit of its creditors, or if a trustee or receiver is appointed for the CONTRACTOR or for any of its property, or if CONTRACTOR files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws, or repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, or repeatedly fails to make prompt payments to SUBCONTRACTORS or for labor, materials or equipment or disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction of the WORK or disregards the authority of the ENGINEER or otherwise violates any provision of the CONTRACT DOCUMENTS, then the OWNER may, without prejudice to any other right or remedy and after giving the CONTRACTOR and its surety a minimum of ten (10) days from delivery of a WRITTEN NOTICE, terminate the services of the CONTRACTOR and take

possession of the PROJECT and of all materials, equipment, tools, construction equipment and machinery thereon owned by the CONTRACTOR, and finish the WORK by whatever method the OWNER may deem expedient. In such case the CONTRACTOR shall not be entitled to receive any further payment until the WORK is finished. If the unpaid balance of the CONTRACT PRICE exceeds the direct and indirect costs of completing the PROJECT, including compensation for additional professional services, such excess SHALL BE PAID TO THE CONTRACTOR. If such costs exceed such unpaid balance, the CONTRACTOR SHALL PAY THE DIFFERENCE TO THE OWNER. Such costs incurred by the OWNER will be determined by the ENGINEER and incorporated in a CHANGE ORDER.

- 18.3 Where the CONTRACTOR'S services have been so terminated by the OWNER, said termination shall not affect any right of the OWNER against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of monies by the OWNER due the CONTRACTOR will not release the CONTRACTOR from compliance with the CONTRACT DOCUMENTS.
- 18.4 After ten (10) days from delivery of a WRITTEN NOTICE to the CONTRACTOR and the ENGINEER, the OWNER may, without cause and without prejudice to another right or remedy, elect to abandon the PROJECT and terminate the CONTRACT. In such case the CONTRACTOR shall be paid for all WORK executed and any expense sustained plus reasonable profit.
- 18.5 If, through no act or fault of the CONTRACTOR, the WORK is suspended for a period of more than ninety (90) days by the OWNER or under an order of court or other public authority, or the ENGINEER fails to act on any request for payment within thirty (30) days after it is submitted, or the OWNER fails to pay the CONTRACTOR substantially the sum approved by the ENGINEER or awarded by arbitrators within thirty (30) days of its approval and presentation, then the CONTRACTOR may, after ten (10) days from delivery of a WRITTEN NOTICE to the OWNER and the ENGINEER terminate the CONTRACT and recover from the OWNER payment for all WORK executed and all expenses sustained. In addition and in lieu of terminating the CONTRACT, if the ENGINEER has failed to act on a request for payment or if the OWNER has failed to make any payment as aforesaid, the CONTRACTOR may upon ten (10) days written notice to the OWNER and the ENGINEER stop the WORK until paid all amounts then due, in which event and upon resumption of the WORK CHANGE ORDERS shall be issued for adjusting the CONTRACT PRICE or extending the CONTRACT TIME or both to compensate for the costs and delays attributable to the stoppage of the WORK.
- 18.6 If the performance of all or any portion of the WORK is suspended, delayed or interrupted as a result of a failure of the OWNER or ENGINEER to act within the

time specified in the CONTRACT DOCUMENTS, or if no time is specified, within a reasonable time, an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, shall be made by CHANGE ORDER to compensate the CONTRACTOR for the costs and delays necessarily caused by the failure of the OWNER or ENGINEER.

19. PAYMENT TO CONTRACTOR

- 19.1 At least ten (10) days before each progress payment falls due (but not more often than once a month), the CONTRACTOR will submit to the ENGINEER a partial payment estimate filled out and signed by the CONTRACTOR covering the WORK performed during the period covered by the partial payment estimate and supported by such data as the ENGINEER may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the WORK but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the OWNER, as will establish the OWNER'S title to the material and equipment and protect the OWNER'S interest therein, including applicable insurance. The ENGINEER will, within ten (10) days after receipt of each partial payment estimate, either indicate in writing approval of payment, and present the partial payment estimate to the OWNER, or return the partial payment estimate to the CONTRACTOR indicating in writing the reasons for refusing to approve payment. In the latter case, the CONTRACTOR may make the necessary corrections and resubmit the partial payment estimate. The OWNER will, within thirty (30) days of presentation of an approved partial payment estimate, pay the CONTRACTOR a progress payment on the basis of the approved partial payment estimate less the retainage. The retainage shall be an amount equal to 10% of said estimate until 50% of the work has been completed. At 50% completion, further partial payments shall be made in full to the CONTRACTOR and no additional amounts may be retained unless the ENGINEER certifies that the job is not proceeding satisfactorily but amounts previously retained shall not be paid to the CONTRACTOR. At 50% completion or any time thereafter when the progress of the WORK is not satisfactory, additional amounts may be retained but in no event shall the total retainage be more than 10% of the value of the work completed. Upon substantial completion of the work, any amount retained may be paid to the CONTRACTOR. When the WORK has been substantially completed except for WORK which cannot be completed because of weather conditions, lack of materials or other reasons which in the judgment of the OWNER are valid reasons for non-completion, the OWNER may make additional payments, retaining at all times an amount sufficient to cover the estimated cost of the WORK still to be completed.
- 19.2 The request for payment may also include an allowance for the cost of such major materials and equipment which are suitably stored either at or near the site.

- 19.3 Prior to SUBSTANTIAL COMPLETION, the OWNER, with the approval of the ENGINEER and with the concurrence of the CONTRACTOR, may use any completed or substantially completed portions of the WORK. Such use shall not constitute an acceptance of such portions of the WORK.
- 19.4 The OWNER shall have the right to enter the premises for the purposes of doing work not covered by the CONTRACT DOCUMENTS. This provision shall not be construed as relieving the CONTRACTOR of the sole responsibility for the care and protection of the WORK, or the restoration of any damaged WORK except such as may be caused by agents or employees of the OWNER.
- 19.5 Upon completion and acceptance of the WORK, the ENGINEER shall issue a certificate attached to the final payment request that the WORK has been accepted under the conditions of the CONTRACT DOCUMENTS. The entire balance found to be due the CONTRACTOR, including the retained percentages, but except such sums as may be lawfully retained by the OWNER, shall be paid to the CONTRACTOR within thirty (30) days of completion and acceptance of the WORK.
- 19.6 The CONTRACTOR will indemnify and save the OWNER or the OWNER'S agents harmless from all claims growing out of the lawful demand of SUBCONTRACTORS, laborers, workmen, mechanics, material men, and furnishers of machinery and parts thereof, equipment, tools and all supplies, incurred in the furtherance of the performance of the WORK. The CONTRACTOR shall, at the OWNER'S request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged, or waived. If the CONTRACTOR fails to do so the OWNER may, after having notified the CONTRACTOR, either pay unpaid bills or withhold from the CONTRACTOR'S unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the CONTRACTOR shall be resumed in accordance with the terms of the CONTRACT DOCUMENTS, but in no event shall the provisions of this sentence be construed to impose any obligations upon the OWNER to either the CONTRACTOR, the CONTRACTOR'S Surety, or any third party. In paying any unpaid bills of the CONTRACTOR, any payment so made by the OWNER shall be considered as a payment made under the CONTRACT DOCUMENTS by the OWNER to the CONTRACTOR and the OWNER shall not be liable to the CONTRACTOR for any such payments made in good faith.
- 19.7 If the OWNER fails to make payment thirty (30) days after approval by the ENGINEER, in addition to other remedies available to the CONTRACTOR, there shall be added to each such payment interest at the maximum legal rate commencing on the first day after said payment is due and continuing until the

payment is received by the CONTRACTOR.

20. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

20.1 The acceptance by the CONTRACTOR of final payment shall be and shall operate as a release to the OWNER of all claims and all liability to the CONTRACTOR other than claims in stated amounts as may be specifically excepted by the CONTRACTOR for all things done or furnished in connection with this WORK and for every act and neglect of the OWNER and others relating to or arising out of this WORK. Any payment, however, final or otherwise, shall not release the CONTRACTOR or its sureties from any obligations under the CONTRACT DOCUMENTS or the Performance and Payment BONDS.

21. INSURANCE - Refer to Information for Bidders - "Section 17 - Contractors Insurance"

21.1 The CONTRACTOR shall purchase and maintain such insurance as will protect it from claims set forth below which may arise out of, or result from, the CONTRACTOR'S execution of the WORK, whether such execution be by the CONTRACTOR, any SUBCONTRACTOR or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

21.1.1 Claims under workmen's compensation, liability benefit and other similar employee benefit acts;

21.1.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of employees;

21.1.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than employees;

21.1.4 Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of offense directly or indirectly related to the employment of such person by the CONTRACTOR, or (2) by any other person; and

21.1.5 Claims for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom.

21.2 Certificates of Insurance acceptable to the Owner shall be filed with the OWNER prior to commencement of the WORK. These Certificates shall contain a provision that coverages afforded under the policies will not be canceled unless at least fifteen (15) days prior WRITTEN NOTICE has been given to the OWNER.

21.3 The CONTRACTOR shall procure and maintain, at the CONTRACTOR'S own expense, during the CONTRACT TIME, Liability insurance as hereinafter specified:

21.3.1 CONTRACTOR'S General Public Liability and Property Damage Insurance including vehicle coverage issued to the CONTRACTOR and protecting the CONTRACTOR from all claims for personal injury, including death and all claims for destruction of or damage to property, arising out of or in connection with any operations under the CONTRACT DOCUMENTS, whether such operations be by the CONTRACTOR or by a SUBCONTRACTOR employed by the CONTRACTOR or anyone directly or indirectly employed by the CONTRACTOR or by a SUBCONTRACTOR employed by the CONTRACTOR. Insurance shall be written with a limit of liability of not less than \$1,000,000 for all damages arising out of bodily injury, including death, at any time resulting therefrom, sustained by any one person in any one accident; and a limit of liability of not less than \$1,000,000 aggregate for any such damages sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than \$1,000,000 for all property damage sustained by any one person in any one accident; and a limit of liability of not less than \$1,000,000 aggregate for any such damage sustained by two or more persons in any one accident; and a combined single limit of liability of not less than \$2,000,000.

21.3.2 The CONTRACTOR shall acquire and maintain, if applicable, Fire and Extended Coverage insurance upon the PROJECT to the full insurable value thereof for the benefit of the OWNER, the CONTRACTOR and SUBCONTRACTORS as their interest may appear. This provision shall in no way release the CONTRACTOR or CONTRACTOR'S surety from obligations under the CONTRACT DOCUMENTS to fully complete the PROJECT.

21.4 The CONTRACTOR shall procure and maintain, at the CONTRACTOR'S own expense, during the CONTRACT TIME, in accordance with the provisions of the laws of the state in which the WORK is performed, Workmen's Compensation Insurance, including occupational disease provisions, for all of the CONTRACTOR'S employees at the site of the PROJECT and in case any WORK is sublet, the CONTRACTOR shall require such SUBCONTRACTOR similarly to provide Workmen's Compensation Insurance, including occupational disease provisions for all of the latter's employees unless such employees are covered by the protection afforded by the CONTRACTOR. In case any class of employees engaged in hazardous work under this contract at the site of the PROJECT is not protected under Workmen's Compensation statute, the CONTRACTOR shall provide, and shall cause each SUBCONTRACTOR to provide, adequate and suitable insurance for the protection of its employees not otherwise protected.

21.5 The CONTRACTOR shall secure, if applicable, "All Risks" type Builder's Risk Insurance for WORK to be performed. Unless specifically authorized by the OWNER, the amount of such insurance shall not be less than the CONTRACT PRICE totaled in the BID. The policy shall cover not less than the losses due to fire, explosion, hail, lightning, vandalism, malicious mischief, wind, collapse, riot, aircraft, and smoke during the CONTRACT TIME, and until the WORK is accepted by the OWNER. The policy shall name as the insured the CONTRACTOR, and the OWNER.

22. **CONTRACT SECURITY**

22.1 The CONTRACTOR shall within ten (10) days after the receipt of the NOTICE OF AWARD furnish the OWNER with a Performance BOND and a Payment BOND in penal sums equal to the amount of the CONTRACT PRICE, conditioned upon the performance by the CONTRACTOR of all undertakings, covenants, terms, conditions and agreements of the CONTRACT DOCUMENTS, and upon the prompt payment by the CONTRACTOR to all persons supplying labor and materials in the prosecution of the WORK provided by the CONTRACT DOCUMENTS. Such BONDS shall be executed by the CONTRACTOR and a corporate bonding company licensed to transact such business in the state in which the WORK is to be performed and named on the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570. The expense of these BONDS shall be borne by the CONTRACTOR. If at any time a surety on any such BOND is declared a bankrupt or loses its right to do business in the state in which the WORK is to be performed or is removed from the list of Surety Companies accepted on Federal Bonds, CONTRACTOR shall within ten (10) days after notice from the OWNER to do so, substitute an acceptable BOND (or BONDS) in such form and sum and signed by such other surety or sureties as may be satisfactory to the OWNER. The premiums on such BOND shall be paid by the CONTRACTOR. No further payment shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable BOND to the OWNER.

23. **ASSIGNMENTS**

23.1 Neither the CONTRACTOR nor the OWNER shall sell, transfer, assign or otherwise dispose of the Contract or any portion thereof, or of any right, title or interest therein, or any obligations thereunder, without written consent of the other party.

24. **INDEMNIFICATION**

24.1 The CONTRACTOR will indemnify and hold harmless the OWNER and the

ENGINEER and their agents and employees from and against all claims, damages, losses and expenses including attorney's fees arising out of or resulting from the performance of the WORK, provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting therefrom; and is caused in whole or in part by any negligent or willful act or omission of the CONTRACTOR, and SUBCONTRACTOR, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

- 24.2 In any and all claims against the OWNER or the ENGINEER, or any of their agents or employees, by any employee of the CONTRACTOR, any SUBCONTRACTOR, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the CONTRACTOR or any SUBCONTRACTOR under workmen's compensation acts, disability benefit acts or other employee benefits acts.
- 24.3 The obligation of the CONTRACTOR under this paragraph shall not extend to the liability of the ENGINEER, its agents or employees arising out of the preparation or approval of maps, DRAWINGS, opinions, reports, surveys, CHANGE ORDERS, design or SPECIFICATIONS.

25. **SEPARATE CONTRACTS**

- 25.1 The OWNER reserves the right to let other contracts in connection with this PROJECT. The CONTRACTOR shall afford other CONTRACTORS reasonable opportunity for the introduction and storage of their materials and the execution of their WORK and shall properly connect and coordinate the WORK with theirs. If the proper execution or results of any part of the CONTRACTOR'S WORK depends upon the WORK of any other CONTRACTOR, the CONTRACTOR shall inspect and promptly report to the ENGINEER any defects in such WORK that render it unsuitable for such proper execution and results.
- 25.2 The OWNER may perform additional WORK related to the PROJECT or the OWNER may let other contracts containing provisions similar to these. The CONTRACTOR will afford the other CONTRACTORS who are parties to such Contracts (or the OWNER, if the OWNER is performing the additional WORK) reasonable opportunity for the introduction and storage of materials and equipment and the execution of WORK and shall properly connect and coordinate the WORK with theirs.
- 25.3 If the performance of additional WORK by other CONTRACTORS or the OWNER is not noted in the CONTRACT DOCUMENTS prior to the execution

of the CONTRACT, written notice thereof shall be given to the CONTRACTOR prior to starting any such additional WORK. If the CONTRACTOR believes that the performance of such additional WORK by the OWNER or others involves it in additional expense or entitles it to an extension of the CONTRACT TIME, the CONTRACTOR may make a claim thereof as provided in Sections 14 and 15.

26. **SUBCONTRACTING**

- 26.1 The CONTRACTOR may utilize the services of specialty SUBCONTRACTS on those parts of the WORK which, under normal contracting practices, are performed by specialty SUBCONTRACTORS.
- 26.2 The CONTRACTOR shall not award WORK to SUBCONTRACTOR(S), in excess of fifty (50%) percent of the CONTRACT PRICE, without prior written notice and approval of the OWNER.
- 26.3 The CONTRACTOR shall be fully responsible to the OWNER for the acts and omissions of its SUBCONTRACTORS, and of persons either directly or indirectly employed by them, as the CONTRACTOR is for the acts and omissions of persons directly employed by the SUBCONTRACTOR.
- 26.4 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 CONTRACT DOCUMENTS insofar as applicable to the WORK of SUBCONTRACTORS and to give the CONTRACTOR the same power as regards terminating any subcontract that the OWNER may exercise over the CONTRACTOR under any provision of the CONTRACT DOCUMENTS.
- 26.5 Nothing contained in this CONTRACT shall create any contractual relationship between any SUBCONTRACTOR and the OWNER.

27. **ENGINEER'S AUTHORITY**

- 27.1 The ENGINEER shall act as the OWNER'S representative during the construction period, shall decide questions which may arise as to quality and acceptability of materials furnished and WORK performed, and shall interpret the intent of the CONTRACT DOCUMENTS in a fair and unbiased manner. The ENGINEER will make visits to the site and determine if the WORK is proceeding in accordance with the CONTRACT DOCUMENTS.
- 27.2 The CONTRACTOR will be held strictly to the intent of the CONTRACT DOCUMENTS in regard to the quality of materials, workmanship, and execution of the WORK. Inspections may be made at the factory or fabrication plant of the source of material supply.

- 27.3 The ENGINEER will not be responsible for the construction means, controls, techniques, sequences, procedures, or construction safety.
- 27.4 The ENGINEER shall promptly make decisions relative to interpretation of the CONTRACT DOCUMENTS.

28. LAND AND RIGHTS-OF-WAY

- 28.1 Prior to issuance of NOTICE TO PROCEED, the OWNER shall obtain all land and rights-of-way necessary for carrying out and for the completion of the WORK to be performed pursuant to the CONTRACT DOCUMENTS, unless otherwise mutually agreed.
- 28.2 The OWNER shall provide to the CONTRACTOR information which delineates and describes the lands owned and rights-of-way acquired.
- 28.3 The CONTRACTOR shall provide at its own expense and without liability to the OWNER any additional land and access thereto that the CONTRACTOR may desire for temporary construction facilities, or for storage of materials.

29. GUARANTEE

- 29.1 The CONTRACTOR shall guarantee all materials and equipment furnished and WORK performed for a period of one (1) year from the date of the payment of the final estimate. The CONTRACTOR warrants and guarantees for a period of one (1) year from the date of the payment of the final estimate, that the completed system is free from all defects due to faulty materials or workmanship and the CONTRACTOR shall promptly make such corrections as may be necessary by reason of such defects including the repairs of any damage to other parts of the system resulting from such defects. The OWNER will give notice of observed defects with reasonable promptness. In the event that the CONTRACTOR should fail to make such repairs, adjustments, or other WORK that may be made necessary by such defects, the OWNER may do so and charge the CONTRACTOR the cost thereby incurred.

- 29.2 To insure reliability of the materials and equipment provided under this Contract, the normal one-year guarantee will be modified as follows:

WHEN a second failure occurs on the same equipment item, component part of an equipment item, material component, or on any item that may be related to a previously failed item, a new one-year guarantee will go into effect when the failed item is repaired. The new guarantee will apply only to the failed and repaired item. The Maintenance and Guarantee Bond of this Contract will also

remain in effect during any of the guarantee extensions due to second failures.

30. TAXES

30.1 The CONTRACTOR will pay all sales, consumer, use, and other similar taxes required by the laws of the place where the WORK is performed.

31. MICHIGAN STATE ELLIOTT-LARSEN CIVIL RIGHTS ACT

31.1 Incorporated by reference in Section 209 of Article 2 of the Michigan State Elliott-Larsen Civil Rights Act of 1976, as amended, which states in part that a contractor and his/her subcontractor(s) shall not “discriminate against an employee or applicant for employee 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, or marital status.” Breach of this covenant may be regarded as a material breach of this Agreement.

32. MICHIGAN HANDICAPPERS’ CIVIL RIGHTS ACT

32.1 Incorporated by reference in Section 209 of Article 2 of the Michigan Handicappers’ Civil Rights Act of 1976, as amended, which states in part that a contractor and his/her subcontractor(s) shall not “discriminate against an employee or applicant for employee with respect to hire, tenure, terms, conditions, or privileges of employment, or a matter directly or indirectly related to employment, because of handicap that is unrelated to the individual’s ability to perform the duties of a particular job or position.” Breach of this covenant may be regarded as a material breach of this Agreement.

33. AMERICANS WITH DISABILITIES ACT

33.1 Incorporated by reference in Section 102 of the American With Disabilities Act, 42 U.S.C. Subsection 12112, which provides that no covered entity shall discriminate against a qualified individual with a disability because of the disability of such individual with regard to job application procedures, the hiring, advancement, or discharge of employees, employee compensation, job training, and other terms, conditions and privileges of employment, and Section 202 of the Americans With Disabilities Act, 42 U.S.C. Subsection 12132, which provides that no qualified individual with a disability shall, by reason of such disability, be excluded from participation in or be denied the benefits of the services, programs or activities of a public entity or be subject to discrimination by any such entity.

STANDARD PROJECT REQUIREMENTS

1. General

All labor, materials and equipment furnished and installed under this Contract shall conform to the requirements of this section, except as otherwise specified in other sections of the Specifications.

2. Use of Michigan Department of Transportation 2012 Standard Specifications and Other Standard Specifications

The handbook entitled "2012 Standard Specifications for Construction" adopted by the Michigan Department of Transportation shall be a Contract Document for this project and shall be binding when cited. The handbook shall hereinafter be referred to as MDOT 2012 Standard Specifications, or alternatively MDOT 2012 Specifications.

Reference to standard specifications of any technical society, organization, or association, or to codes of local or state authorities, shall mean the latest standard, code or specification adopted and published at the date of taking bids, unless specifically stated otherwise.

3. Schedule of Construction

Within fourteen (14) days of the Notice to Proceed and before beginning any work, the Contractor shall submit to the Engineer, a proposed schedule of construction for the various sections and elements of the project. The schedule shall contain the approximate dates for beginning and completion of the various parts of the work. The Engineer shall review and approve the proposed schedule and shall have the right to make any reasonable changes in the schedule which may be in the best interests of the Owner.

4. Construction Site

All construction will take place within the limits of property presently owned by the Owner, including street right-of-ways, or on private property in easements obtained by the Owner, or in Michigan State Highway Right-of- Ways. Street right-of-way lines and construction easement limits on private property are shown on the Drawing and the Contractor shall confine his operations within these lines, unless the Contractor obtains written permission from the respective property owners for additional working space. The Contractor shall be responsible for all damage to private or public property and restoration shall be in accordance with the Drawings and Specifications.

5. Temporary Pumping of Sewage and Ground Water

The Contractor shall be responsible for providing all necessary equipment for adequate size, capacity and reliability for pumping sewage and ground water during the construction. No additional payment shall be made for the dewatering or sewage pumping as part of this contract, unless specifically provided for in the Bid Proposal.

Sanitary sewage which must be pumped on a temporary basis during construction shall be discharged to nearby sanitary sewers and under no circumstances shall sewage be discharged to storm sewers or water courses.

The pumping of ground water where required for construction shall be discharged to nearby storm sewers or water courses, if such water is of a clean nature free from excessive silt and polluting materials. The Contractor shall not discharge quantities of water in excess of the capacity of existing storm sewers or water courses and he shall be responsible for any damage incurred to storm sewers or water courses which result from actions of the Contractor. Storm sewers used for ground water discharge shall be maintained and left in a clean condition. Equipment used by the Contractor for temporary pumping of sewage or ground water shall be adequately equipped with suitable muffler to reduce the operating noise to a level acceptable to the Engineer. The use of excessively noisy equipment for night time pumping will not be allowed. The Contractor is encouraged to use electrically driven pumps to eliminate pumping noise.

Prior to beginning construction, the Contractor shall advise the Engineer, in detail of his plan for temporary pumping of sewage and ground water. This plan will include a description of the equipment to be used and it's expected noise rating in decibels.

6. Soil Erosion and Sedimentation Control

All work under this contract shall be done in accordance with the Soil Erosion and Sedimentation Control Act of 1972, Act 347 of Michigan. Any permit required for this purpose will be taken out by the Owner. It shall be the Contractor's responsibility to adhere to all requirements of the permit and the Soil Erosion and Sedimentation Control Act.

7. Shop Drawings

The Contractor as soon as possible shall submit to the Engineer shop drawings and delivery schedule (6 copies) for every item of equipment or material to be incorporated in the work which is fabricated or manufactured off the site, including those pertaining to structural and reinforcing steel, electrical, plumbing, carpentry, heating and ventilation. The Contractor shall make any corrections in the drawings required by the Owner or the Engineer, who after checking will retain three copies and return three copies to the Contractor.

The Engineer's review of shop drawings of equipment and materials shall extend only to determining the conformity of such equipment and materials with the general features of the

Contract Drawings and Contract Specifications prepared by the Engineer. It shall be the responsibility of the Contractor to determine the correctness of all dimensions and minor details of such equipment and materials so that they will fit into the completed work and so that when incorporated in the work correct operation will result. The Contractor shall also be responsible for furnishing and installing such equipment and materials which fully meet the requirements of specifications for performance and reliability.

The shop drawings shall indicate shop painting treatments, including type and manufacturer of paint.

Nameplate data for equipment with electric motors shall be included on the shop drawings.

Shop drawings for major systems or assemblies shall be submitted in complete sets.

No work shall be done with the item in question, until the Engineer has reviewed the shop drawings.

8. Laws, Ordinances, Codes and Regulations

The Contractor and Subcontractor shall observe and comply with all Federal, State and Local codes, ordinances, laws and regulations in force at the construction site, and shall protect and indemnify the Owner and the Owner's officers and agents against any claim or liability arising from or based on any violation of the same.

The Contractor shall pay for and obtain all licenses and permits for the work, pay all charges for inspection and tests, and file Drawings and Specifications to the inspection department having jurisdiction, unless otherwise indicated.

The Contractor will be responsible for notifications and inspections required under any permit.

9. Fences

No fences shall be removed or destroyed by the Contractor without the written permission of the Engineer. The Contractor shall be held fully responsible for any damages caused by his work to adjoining fences. Fences that have to be removed shall be preserved and replaced in a manner acceptable to the Engineer. Damaged material shall be replaced by new material.

10. Monuments or Stakes

The Contractor must carefully protect from disturbance or injury all monuments of City, County, State or Federal Government, stakes and bench marks, and shall not excavate nearer than five feet (5') to any of them without the permission of the Engineer, or until they have been removed, witnessed or otherwise disposed of by the Engineer. Monuments, stakes or bench marks

destroyed by the Contractor prior to approval of the Engineer shall be replaced by the Engineer. Cost of said replacement shall be charged to the Contractor.

II. Mutual Responsibility of Contractors

If, through acts of neglect on the part of the Contractor, any other Contractor or any subcontractor shall suffer loss or damage on the work, the Contractor shall settle with such other contractor or subcontractor by agreement or arbitration. If such other contractor or subcontractor shall assert any claim against the Owner on account of any damage alleged to have been sustained, the Owner shall notify the Contractor, who shall indemnify and save harmless the Owner against any such claim.

12. Protection of Trees and Shrubs and Transplanting

The Contractor shall protect from damage all trees and shrubs and other items which are not designated by the Engineer for removal. Trees removed as part of the construction shall be considered incidental to construction, unless otherwise provided for in the Bid Proposal. Trees and shrubs required by the Engineer to be transplanted and which can be transplanted by hand shall be considered incidental to construction, unless otherwise provided for in the Bid Proposal. Trees required by the Engineer to be transplanted and which require the use of a tree spade shall be paid for at the bid price when so provided in the Bid Proposal. The tree spade shall be of sufficient capacity to relocate trees up to six (6) inches in trunk diameter.

13. Street Maintenance

All streets where construction trucking takes place under this Contract shall at all times be maintained by the Contractor, unless otherwise indicated. At all times shall the Contractor have available on the project adequate and suitable road maintenance equipment. The Contractor shall provide dust control measures for all streets where construction work has been completed or is ongoing and for all streets utilized as detour routes during construction. Dust shall be controlled by adding either granular or liquid chloride or other approved materials in a sufficient amount to control the dust. Where extreme dry conditions exist, the Engineer may also require water to be added to the street surface.

If the Contractor fails to provide adequate street maintenance and dust control, the Engineer shall stop the construction work until such time as all streets are properly maintained.

Spillage of materials or mud tracking on streets or roads where hauling or trucking takes place shall be prevented. Any accidental spillage or tracking shall be immediately cleaned up as required by the Engineer.

14. Maintaining Traffic

The Contractor shall cooperate in every respect with the local Fire Department, Police Department, and DPW, Michigan Department of Transportation, the County Road Commission, and the Engineer in maintaining safe traffic conditions on the project at all times and for providing access to private property adjacent to the construction for emergency vehicles. The Contractor shall provide and maintain throughout the time of construction, all lights, barricades, signing, flag men, and other safety equipment in accordance with the Michigan Manual of Uniform Traffic Control Devices and which may be required by the Engineer. The Contractor shall coordinate his operations with the local governing agencies having jurisdiction to provide advance notice of the closing of any street. The Contractor shall provide 24-hour maintenance of all traffic safety equipment and shall provide telephone numbers of at least two persons for contact in case of emergency.

Streets, except State Highways, subject to construction work under this Contract may be closed to all traffic, except emergency vehicles, during normal working hours (7:00 a.m. to 5:00 p.m.) but shall be open for local traffic during night hours. The Contractor shall not close any street to traffic without prior notification of all property owners and allowance of sufficient time for evacuation and the Contractor shall conduct his operation at all times to provide ready access to residences and businesses abutting the construction areas, by emergency vehicles. Driveways shall be repaired and restored immediately after construction to provide access to property by the owners. All signing and barricades shall meet the requirements of the Michigan Manual of Uniform Traffic Control Devices. The Contractor shall be solely responsible for maintaining safe traffic conditions for vehicles and pedestrians at all times.

15. Incidental Work

All work to be done by the Contractor shown on the Drawings or as specified and enumerated in the clauses of the Specifications and also any and all minor details of the work not specifically mentioned in the Drawings or Specifications but obviously necessary for the proper completion of the work, such as the proper connection of new work to old, shall be considered as incidental to and so being a part of and included with the work for which prices are named in the Contract Documents. The Contractor will not be entitled to any extra or additional compensation unless specifically stated otherwise.

16. Injuries to Persons and Property

The Contractor alone shall be held responsible for all injuries to persons and for all damages to property of the Owner or others, caused by or resulting from the actions or the negligence of himself, his employees or agents during the progress of or connected with the prosecution of the work, whether within the limits of the work or elsewhere. He must restore all injured public or private property in accordance with the drawings and specifications and as a minimum, to a condition as good as when he started the work, purchasing new materials to replace all that which is injured or destroyed during the course of the work.

Should the Contractor refuse to make such repairs or not show due diligence therein the Owner may make or cause to be made such necessary repairs, and the cost thereof shall be deducted from any money which may be due or become due from the Owner. All private property must be left in a condition satisfactory to the Owner.

17. Safety

The Contractor and Subcontractor shall comply with Federal, State and Local laws and regulations governing the furnishing and use of safeguards, safety devices, and protective equipment, and take any other needed actions on his own responsibility as necessary to protect the life and health of employees on the job and safety of the public and to protect property during the construction of the project.

The "Safety and Health Regulations for Construction" and subsequent amendments promulgated by the U.S. Department of Labor must be followed on the construction of this project. These regulations are identified as Chapter XVII of Title 29, Code of Federal Regulations (CFR), Part 1926.

All of the Contractors' and Subcontractors' operations and construction equipment shall comply with the requirements of the Michigan Occupational Safety and Health Act, Act 154, P.A. 1974, and Michigan Occupational Safety and Health Rules and Standard, insofar as they apply to the work to be performed under this Contract.

On all tunneling operations, the Contractor and Subcontractors shall comply with the requirements of the Michigan Occupational Health and Safety Standards for Construction, specifically Chapter VI, Part IV - Control Measures for Hazardous Atmospheres. Copies of the Standard are available from the Michigan Department of Health and the Department of Labor.

18. Utilities

The locations and elevations of existing underground utilities as shown on the plans are only approximate. No guarantee is either expressed or implied as to the completeness or accuracy thereof. The contractor shall be exclusively responsible for determining the exact utility locations and elevations prior to the start of construction. It is the contractor's responsibility to notify the various utility owners in accordance with Michigan's P.A. No. 53 of 1974.

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

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

When it is the policy of utility owners to make repairs to damaged conduit or other structures, the Contractor shall cooperate to the fullest extent with the utility and he shall see that his operations interfere as little as possible with those operations.

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

Unless otherwise indicated on the Drawings, the Contractor shall replace any disturbed sewer or drain, or relay same at a new grade to be established by the Engineer such that sufficient clearance for the sewer will be provided.

The Contractor will receive no extra compensation for replacement of sewers or drains encountered, whether shown on the plans or not, connections to new sewers, or for relaying at a new grade and/or line where necessary, except where specifically noted otherwise on the Drawings or in the Specifications.

19. Contractors Responsibility to Maintain Record Drawings

To assist the Engineer in preparation of final record drawings and to ensure that any construction details which are in variance from the Construction Drawings are properly recorded, the Contractor shall maintain in his field office a set of Drawings upon which any such changes are neatly recorded. The Engineer shall furnish the Contractor with a set of Construction Drawings prior to start of construction and from time to time during construction shall check with the Contractor for insuring that this set is properly maintained and complete.

20. Concrete Sidewalks

All work for sidewalk construction shall conform to the requirements of MDOT 2012 Standard Specifications, Concrete Sidewalk. Materials for sidewalks shall meet the requirements of the appropriate section of the MDOT 2012 Standard Specifications. Concrete shall be MDOT Grade P1 having a compressive strength of 3500 psi in 28 days.

Remolded bituminous expansion joints, 1/2-inch thick shall be placed at all intersections of sidewalks, where sidewalks meet curb and gutter or driveways and every 50 feet of sidewalk.

Concrete sidewalk shall be uniform 4-inch thickness except at driveways where the sidewalk shall be 6-inches thick for the full width of the driveway.

Sidewalks shall be constructed to lines and grades as set by the Engineer or in accordance with the Engineer's instructions where existing walks, curb and gutter or other structures control the location and elevation of the new walk. Sidewalks shall be neatly marked and edged in accordance with good practice and according to instructions by the Engineer. A light broom

finish shall be provided.

21. Disposition of Surplus Excavated Materials

Unless indicated otherwise, all surplus excavated material resulting from construction on this project shall be hauled and disposed of by the Contractor. The Contractor shall provide all necessary equipment for loading, hauling and disposal of the material. Hauling trucks shall not be overloaded and spillage of material from trucks along the haul routes will not be allowed and the Contractor shall be responsible for prompt cleaning of streets where spillage occurs. The cost of all hauling and disposal of surplus material shall be incidental to the construction work.

22. Boring, Jacking and Tunneling

Where required on the Drawings, the Contractor shall bore and jack steel casing pipe. The bid price shall include all materials, labor and appurtenances necessary for completion of each bore. Boring under State Highways shall be in accordance with MDOT requirements.

Tunneling of trees, where required on the Drawings, shall be paid at the unit amount bid times the distance from drip edge to drip edge of the tree.

23. Sanitary Facilities

The Contractor shall provide at convenient points, properly secluded from observation, a sufficient number of toilets for the use of the employees and shall maintain them strictly without nuisance and without offense to the public or to residents in the vicinity of the work. The number, location, character, condition and maintenance of these facilities must at all times be such as will meet the approval of the Engineer and OSHA requirements.

24. Equipment and Material Storage

Pumps and other machinery shall be stored in weathertight buildings furnished by the Contractor. Motors, electrical switchgear, and other equipment of a delicate nature, shall be stored in weathertight warehouses which are maintained at a temperature of at least 60-degree F. Steel and iron items may be placed in open yard storage, but any such items having attached motors or other machinery units shall have such units well wrapped with waterproof material for protection from the weather.

Painted surfaces shall be protected against impact, abrasion, discoloration, and other damage. All painted surfaces which are damaged prior to acceptance of equipment shall be repainted to the satisfaction of the Engineer.

Materials and equipment stored and placed upon or near the site of the work shall at all times be

so located as not to interfere with work being prosecuted by other Contractors in the employment of the Owner or with street drainage. The Contractor shall be fully responsible for any damage from any cause, to stored materials. Damaged materials shall be replaced with new before incorporating said materials into the work.

25. Construction Clean Up

Immediately after the completion of the work or any portion of it, the Contractor shall remove all unused material, refuse or dirt placed at the site or in the vicinity of the work or resulting from its prosecution and restore the site in as clean and sightly condition as before the work was begun. All work areas shall be left in as good a condition as before the construction was started.

26. Contractor Responsibilities

The Contractor shall have charge of and shall be responsible for the entire work under this Contract until its completion and acceptance by the Owner. A competent superintendent, foreman and other representative invested with sufficient authority to conduct the work properly shall be maintained on the work at all times. The superintendent or foreman shall be acceptable to the Engineer and shall be employed by the Contractor for the duration of this job. No change in superintendents or foreman shall be made without the approval of the Engineer. When in the opinion of the Engineer, the superintendent or foreman is not competent for any reason, he shall be immediately relieved of his responsibility as relates to this project and shall be dismissed from the job site when requested by the Engineer. The Engineer shall be the sole judge as to the qualifications and competency of the superintendent or foreman.

27. Changes in Scope of Work

The Owner shall have the right to make alterations in any of the work herein contemplated either before or after its commencement, when such changes are defined in a written change order by the Engineer, and provided such changes do not change the total volume of work more than twenty-five percent (25%), or do not change the general nature and scope of the work. If such alterations diminish the quantity of the work to be done, or diminish the quantity of material to be furnished, they shall not constitute a claim for damages or for anticipated profits on the work dispensed with. The Contractor shall, however, be reimbursed for any expenses he has incurred on the deleted work. If the changes increase the amount of work, or the amount of material furnished, such increase shall be paid for according to the quantity of work actually done, and the quantity of material actually furnished and the price or prices actually stipulated in this Contract, payment either for labor performed or materials furnished shall be in accordance with the Contract Bid Proposal and accepted as full payment.

Upon mutual agreement of written change order, between the Owner and the Contractor, quantities or volumes of work may be changed more than the above stipulated twenty-five percent, such changes to be at the prices shown in the Proposal. If the quantities or volumes of

work are changed at the time of award of the Contract, the Owner shall have the further right to increase or decrease such revised quantities or volumes by twenty-five percent (25%) by subsequent change order at any time prior to date of substantial completion.

28. Care of Construction Seeding

Dear Homeowner:

A portion of the area you maintain as lawn has been (or soon will be) restored by placement of topsoil, grass seed, fertilizer, and mulch. The goal is to restore your disturbed lawn area to a condition close to what it was prior to construction.

Once restoration work is complete it will be necessary for you to sprinkle the restoration area frequently, inspect for stones and twigs once (sprinkling reveals buried stones and twigs), and mow once grass gets ankle high. Fertilizer and weed killer should not be necessary for at least 1 year.

Newly placed topsoil is usually quite soft until it settles (2-3 weeks or 1 good rain shower) and keeping children, pets, and lawnmowers off until the grass is ankle high is recommended.

By taking these steps the lawn area disturbed during construction will be restored quickly and look nice.

We appreciate your patience and understanding.

MATERIAL TESTING

Bidders shall prepare their bids for the materials specified herein and as listed in these Specifications or designated on the Drawings. Material tests shall be in accordance with the following requirements or as may be required under appropriate section of MDOT 2012 Standard Specifications, whichever is most stringent as determined by the Engineer.

1. General:

All materials incorporated in this contract shall be subject to inspection and test as follows: All tests except as noted, shall be made by an independent established Testing Laboratory, employed and paid for by the Owner. Samples at the mill or factory shall be taken by a representative of the Testing Laboratory. Samples of a construction materials from the site of the work, such as sand, gravel, concrete cylinders, pipe, etc., for which laboratory tests are required shall be taken assembled or prepared on the site of the work by representatives of the Testing Laboratory. Any necessary containers, shipping boxes, or crates shall be supplied by the Testing Laboratory. The Contractor shall furnish, without additional charge, all material that may reasonably be required for testing purposes. Visual tests of all materials and slump tests of concrete required under the following schedule will be made by the Engineer without cost to the Contractor.

The tests to be made, the number of samples, and acceptance and rejection shall be based on the standards and tentative standards of the American Society for Testing Materials (ASTM), unless otherwise noted. Two signed copies of test reports on Testing Laboratory forms or letterhead shall be delivered to the Engineer as soon as available. Wherever in the following tabulation the letters A.S.T.M. are used, they shall be interpreted to mean the latest Standard Specifications of the American Society for Testing Materials.

The following is a listing of tests required for materials to be incorporated into the work. All laboratory tests called for shall be by an independent commercial laboratory approved by the Engineer. The Engineer may require, in lieu of independent laboratory tests, that a certification of the quality of material shipped to the project, be provided by the manufacturer. Where certifications are accepted in lieu of Owner tests, the certifications shall be furnished by the contractor or manufacturer at no charge to the owner. Certifications when so required shall be provided on the basis of A.S.T.M. specifications or other standards acceptable to the Engineer.

2. Cement:

Tests shall be made on the entire cement requirements on car samples or bin (sealed) samples.

Sampling and number of tests shall be performed in compliance with A.S.T.M. Specification Serial Designation C183. The following outlined tests shall be performed in compliance with the A.S.T.M. Specification Serial Designation listed.

A.S.T.M. Serial Designation

Fineness	C115
Expansion	C151
Time of Setting	C191
Compressive Strength	C109
Tensile Strength	C190
Content	C185

Chemical analysis tests will not be required unless specifically designated in the Special Conditions of the Contract.

3. Sand:

Standard Tests shall be made in advance of concreting per A.S.T.M. C33 and A.S.T.M. C40 on each fine aggregate proposed to be used. Other tests being satisfactory, the aggregate may be used pending results of 28-day mortar strength tests. Tests shall also be made as the work progresses on each 1,000 cubic yards of fine aggregate for concrete to assure uniformity.

4. Gravel, Stone:

Standard Tests shall be made in advance of concreting on each grading of each coarse aggregate proposed to be used, per A.S.T.M. C33. However, the requirements of P. 11 may be omitted for gravel and crushed stone if evidence is furnished showing that the material has proved satisfactory as coarse aggregate in concrete which has been subjected for a period of at least five years to essentially the same conditions of service and exposure as the structure in which the material is to be used. Tests shall also be made as the work progresses on each 1,000 cubic yards of coarse aggregate for concrete to assure uniformity.

5. Concrete:

Advance Tests to the concrete shall be made in accordance with A.S.T.M. C31. Four standard 6" compression cylinders, 2 to be tested at 7 days and 2 at 28 days, per A.S.T.M. C39, shall be made with the proportioning and materials proposed to be used in the major part of these tests if suitably referenced on the reports which shall be issued at 7 to 28 days. These tests shall be repeated if necessary, because of changes in materials or unsatisfactory results.

During the progress of the work, and for each different mix of concrete, a set of 2 standard 6" concrete cylinders shall be made and tested, where from 10 to 100 cubic yards of concrete are placed, during each and every day's operation. On pours of less than 10 cubic yards, the engineer may require samples at the rate of 2 per pour.

An additional set of cylinders shall be made for each 100 cubic yards or major fraction thereof over and above the first 100 cubic yards. The cylinders of each set shall be molded from the same sample of concrete and tested at 7 days or at 28 days as may be specially desired. Sampling of concrete for test purposes shall be per A.S.T.M. C172. Making and curing of test cylinders shall be per A.S.T.M. C31. Testing of specimens shall be per A.S.T.M. C39.

Where 25 or more cubic yards of concrete are placed, and as necessary to maintain desired consistency of the concrete a slump test shall be made per A.S.T.M. C143. Not less than one such test be made for each 50 cubic yards of concrete placed at one operation. Such test shall also be made on each sample of concrete used in fabricating test specimens.

6. Brick for manholes, catchbasins, and valve basins:

Visual inspection at site, for conformance with A.S.T.M. C32. Sampling and testing per A.S.T.M. C67 for conformance with A.S.T.M. C32 by an independent laboratory paid for by the Contractor, or manufacturers certification.

7. Brick: (Bldg.):

Tests by independent laboratory, for each 50M delivered, including first sampling and testing per A.S.T.M. C67 for conformance with brick specified per A.S.T.M. C62, paid for by the Contractor.

8. Precast Reinforced Manhole Section:

Visual inspection at the site for conformance with A.S.T.M. C478 and for the elastomer joints A.S.T.M. C443. Tests by an independent laboratory per the above A.S.T.M. sections for conformance, and certification by the manufacture.

9. Concrete Block for Manholes, Catchbasins and Valve Basins:

Visual inspection at site for conformance with A.S.T.M. C139, tests by independent laboratory, paid for by the Contractor, or certification by manufacture.

10. Vitrified Sewer Pipe:

Visual inspection at the site for conformance with A.S.T.M. C-700 E.S. and certification by the manufacturer.

11. PVC Pressure and Non-Pressure Pipe:

Each piece of pipe shall bear the Manufacturers name and number, and shall be certified by the Manufacturer to have met the requirements of A.S.T.M. D2241, D3139, D3034, D3212 and F477.

12. ABS Truss Pipe and ABS Solid Wall Pipe:

Each piece of pipe shall bear the Manufacturers name and number and shall be certified by the Manufacturer to have met the requirements of A.S.T.M. D2680 and D2751.

13. Concrete Sewer Pipe: (8" and 10" diameter pipe).

Visual inspection at the site, for conformance with A.S.T.M. C14 and manufactures certifications.

14. Reinforced Concrete Sewer and Culvert Pipe: (12 inch diameter and larger)

Visual inspection at the site for conformance with A.S.T.M. C76 and manufactures certification.

15. Ductile Iron Pipe and Fittings:

Each piece of pipe shall bear the manufacture's serial number, and shall be certified by the Manufacturer to have met the requirements of A.N.S.I. 21.51, 21.10, 21.11 and 21.40. Also, each piece shall be visually inspected in the field for specifications conformance. Inspection and laboratory tests at source by independent testing laboratory for conformance with the A.N.S.I. numbers for Iron Pipe and Fittings if more than 200 tons are required. These tests shall be paid for by the Owner.

16. Prestressed Concrete Cylinder Pipe:

Cement, sand, gravel, stone and concrete shall be tested, as specified in Paragraphs 2, 3, 4 and 5 of this section. Tests by independent testing laboratory on cylinder steel, and bar wire reinforcing and manufactures certification.

17. Non-Cylinder Prestressed Concrete Pipe:

Cement, sand, gravel, stone and concrete shall be tested as specified in Paragraphs 2, 3, 4 and 5 of this section. Tests by independent testing laboratory on bar and wire reinforcing, paid for by the Contractor, or certification by the manufacture.

18. Building Stone:

Visual inspection on site, tests by independent laboratory per A.S.T.M. C97, C99, C218 and CI70, paid for by the Contractor.

19. Reinforcing:

Inspection and tests by an independent laboratory for conformance with the A.S.T.M. Specifications, paid for by the Contractor or manufactures certification.

20. Structural Steel & Misc. Steel and Metal:

Where less than 50 tons are required field inspections for rust, dimensions, riveting, welding, painting, etc., shall be performed by the Engineer.

Where more than 50 tons are required, certified copies of mill tests on steel used in fabrication and shop inspection by an independent laboratory per A.S.T.M. A7, as revised, shall be submitted to the Engineer.

21. Bituminous Mixtures:

Shall be as per the notes on the construction Drawings or otherwise in accordance with MDOT 2012 Standard Specifications.

22. Optional Concrete Pipe Specifications:

The ASTM C-655 Specification which allows the supplier of concrete pipe to take advantage of local materials to produce a concrete pipe capable of meeting high load requirements is allowed. This specification bases the strength of a particular pipe on actual pipe load performance rather than rules of minimum reinforcement and compressive concrete strength. Tests which provide performance data on local materials shall be submitted to the Engineer for approval.

SEWER CONSTRUCTION

1. Scope of Work

This work includes the furnishing of all labor, materials and equipment required for the construction, and placing in operation, of the work, complete and in accordance with the Specifications and Drawings.

2. Materials

Bidders shall prepare their bids for the materials as listed in these Specifications and as designated on the Drawings. If the bidder wishes to propose materials other than those listed herein, he shall request the use of such material to the Engineer in time to permit its consideration and the issuance of an appropriate Addendum, if required.

3. General Method of Construction

Sewers shall be installed as shown on the Drawings. All work of construction shall conform to MDOT 2012 Standard Specifications. Backfill for trenches shall be as described in these Specifications or as noted on the Drawings.

The Contractor shall conduct his construction for each sewer line in such a manner as to result in 100 feet or less of open ditch at any one time and backfilling will accompany excavation in such a manner as to avoid large piles of surplus spoil. Some surplus of material will usually result from backfilling and this material shall be hauled to points designated in the Specifications or Drawings or as designated by the Engineer. All hauling and other costs related to disposal of excess spoil are incidental to this Contract and no payment will be allowed for this work.

A construction procedure in which the streets are continuously cleaned up on a block-by-block basis is an important part of this project. The Contractor shall clean up each block of constructed sewer and shall secure the Engineer's permission before beginning construction on each new block of the project.

4. Excavation for Sewers

- (a) Earthwork.--Earthwork shall include the furnishing of all labor, materials, and equipment necessary for excavation, trenching or tunneling in earth and in rock, the complete drainage of excavations, the temporary and permanent sheeting, bracing and shoring of sides of excavations, the disposition of excavated materials during construction and of excess excavated materials after backfilling, and the backfilling around the completed structures, as required in this work. Cost of all

earthwork, backfilling, drainage and other work described in this section shall be included in the amount bid per lineal foot of sewer construction.

- (b) Classification of Excavation. --Earth, as a name for excavated material, shall include all glacial deposit, whether cemented or not, except solid boulders one-half cubic yard or more in volume. It shall include all alluvial deposits and material of every kind that can be excavated with equal facility by the equipment and means used for other earth excavation in the work. Rock, as a name for excavated, shall include pre-glacial solid ledge rock that can be removed most practically by blasting, barring, or wedging or by some other standard method of quarrying solid rock; it shall include boulders of one-half cubic yard in volume. It shall not include fragile, friable, or disintegrated materials of any kind that can be excavated with equal facility by equipment and means used for earth excavation in this work.
- (c) Method of Excavation. --All excavation shall be by open cut from the surface except where otherwise indicated on the Drawings. All excavations for sewers and appurtenances shall be made up in such a manner and to such depth and width as will give ample room for building the structures and for bracing, sheeting and supporting the sides of the excavation for pumping and draining of ground water and sewage which may be encountered, and for the removal from the trench of all materials excavated.
- (d) Limits of Excavation in Earth. -- In that part of the ditch which is below the top of the pipe, the trench width shall not be greater than two (2) feet, plus the nominal pipe diameter.

In excavating for sewers, the excavation shall at all times be finished to the required grade for an adequate distance in advance of the completed sewer, but, unless otherwise permitted by the Engineer, not more than 100 feet of trench shall be open at one time in advance of the sewer. The length of street which may be occupied by the construction work at any one time shall be subject to the direction of the Engineer and will be based on the requirements of use of the street by the public. Not more than 1,000 consecutive feet of length of street shall be occupied at one time, and vehicle traffic through the street shall not be entirely stopped without the permission of the Engineer.

- (e) Disposal of Water and Sewage. --The Contractor shall remove by pumping, bailing, or other acceptable method all water which may accumulate or be found in the trenches and other excavations made under this Contract and he shall take all necessary precautions to keep the trenches and other excavations entirely clear of water while the sewers and other structures are being constructed. Where existing sewers or drains are encountered in the construction of the work, the Contractor shall make adequate provision for diverting the flow of the existing sewers or drains so as to keep the work entirely dry during construction. Newly

placed concrete shall be adequately protected from injury resulting from ground water or sewage, or from the handling or disposal of water and sewage. The Contractor shall at all times have sufficient pumping equipment ready for immediate use to carry out the intent of this paragraph.

Existing house sewers encountered in the excavation shall be temporarily reconnected to the existing sewer until the new sewer has been completely tested and approved. No connections to new sewers will be allowed until tested and approved.

- (f) Well Pointing and Other Measures for Stabilization of Construction Areas.--If wet areas of construction are encountered, the Contractor shall make use of well pointing equipment and of other measures which, in the judgment of the Engineer are required for laying sewer under dry conditions and with proper bedding of the pipe. The use of pre-approved stone for stabilization will be allowed when such use is requested by the Contractor. The Contractor shall include the cost of furnishing well pointing equipment and of all expenses for labor and power for the operation of well pointing equipment and for the furnishing and placing of stone in the unit cost bid for construction of the sewers. No extra payment shall be allowed for well pointing or the use of stone. It shall be the condition of this contract that the Contractor shall pay all costs for dewatering, pumping, furnishing and placing of stone and all other costs for construction in wet or unstable ground and these costs shall be considered incidental to the construction.

- (g) Bracing and Sheeting. --The Contractor shall furnish, put in place, and maintain such sheeting, bracing, and shoring, as may be required to properly support the sides of any excavation and to prevent any movement of earth which could in any way injure the work under construction. If the Engineer is of the opinion that, at any point, sufficient and proper supports have not been provided, he may order additional supports at the expense of the Contractor; but neither the placing of such additional supports by the order of the Engineer nor the failure of the Engineer to order such additional supports placed, shall release the Contractor from his responsibility for the sufficiency of such supports and the integrity of the work and protection of existing adjacent property or structures from damages. In the removing of sheeting and bracing after the sewer or appurtenances have been constructed, special care shall be taken to prevent any caving of the sides of excavation and injury to the completed work or to adjacent property. No payment will be allowed the Contractor for bracing and sheeting except for sheeting left in place upon orders of the Engineer.

- (h) Accident Prevention. --Precaution shall be exercised at all times for the protection of persons (including employees) and property. The safety provisions of applicable laws, building and construction codes shall be observed. Machinery, equipment and all hazards shall be guarded (or hazards eliminated) in accordance with the safety provisions of the Manual of Accident Prevention in Construction,

published by the Associated General Contractors of America, and all OSHA regulations.

- (i) Use of Explosives. --Explosives shall be used only with the permission of the Engineer and in accordance with the laws and regulations applying thereto. Blasting shall be done only by skilled workmen with extreme care for the convenience and safety of property and the public.

5. Sewer Construction

- (a) Intent. --It is the intent of this section of the specifications to provide for a type of sewer construction which results in properly bedded sewers which are true and to the proper grades as designated on the Drawings. All divisions of the Specifications which relate to the construction of sewers shall be interpreted as pointing toward construction procedures which result in structural strength of the sewer pipe at least equal to that of the applicable ASTM Test.
- (b) Preparation of Trench Bottoms. --The foundations in the trench shall be formed to prevent any subsequent settlement and resulting excessive pressure to the sewer pipe after backfilling. If the foundation is rock, an equalizing bed of concrete or well compacted sand shall be placed on the rock with a thickness of at least four (4) inches. If the subgrade is of unstable soil, well pointing or the use of stone will be required in accordance with the Specifications to assure that settlement is eliminated. The subgrade shall be carefully formed so that the pipe rests on the correct line and grade. The Contractor may provide the required grade, by:
 - 1. Stopping trenching approximately 2 inches above the finish grade and hand-finishing the trench by excavating a shallow trough to receive the bottom quadrant of the pipe barrel. In addition, bell holes shall be excavated so that after the placement, only the barrel of the pipe receives bearing pressure from the trench bottom. This procedure may be used in clay soils or in other stable soils but is not applicable to water sands or when soil conditions are unstable.
 - 2. Excavation to a level four (4) inches or more below the final grade line and refilling with compacted embedment material to the finish grade. This procedure may be used in stable soils but is not applicable to unstable soils.
 - 3. When stone is used to stabilize the trench bottom and/or for dewatering purposes, the stone shall be placed to a point 12-inches over the installed pipe and shall be the embedment material. Backfill requirements above this point shall be as defined on the Drawings or Specifications.

- (c) Joints. --It shall be the Contractor's responsibility to meet the leakage requirements of these Specifications.

If infiltration tests or other tests by the Engineer show that the Contractor is not meeting the leakage test, the Engineer may require the Contractor to re-lay areas which show serious infiltration or may require the Contractor to use other construction methods which bring the infiltration rate for each "reach" of sewer to a rate which is within the scope of that required by the Specifications. The word "reach" shall be defined as the distance between two consecutive manholes.

- (d) Pipe Laying. --Pipe shall be protected during handling against impact, shocks, and free fall. Pipe shall be kept clean at all times and no pipe shall be used in the work which does not conform to the appropriate ASTM specifications.

The laying of pipe in finished trenches shall be commenced at the lowest point, with the spigot ends pointing in the direction of flow. All pipes shall be laid with ends abutting and true to line and grade. They shall be carefully centered so that when laid they form a sewer with a uniform invert.

Preparatory to making the pipe joints all surfaces of the portions of the pipe jointing material shall be clean, free of dirt or stones and dry. Lubricants, primers, adhesives and other materials shall be used as recommended by the pipe or joint manufacturer's specifications. The jointing materials shall be joined and adjusted in such a workmanlike manner as to obtain the degree of water tightness required. Trenches shall be kept water- free and dry during bedding, laying and jointing the pipe and for as long as required for proper setting of the joint.

As soon as possible after the joint is made, sufficient embedment material shall be placed along each side of the pipe to offset conditions which might tend to move the pipe off line and grade.

The Contractor shall use a suitable alignment laser for horizontal and vertical alignment. The use of batter boards and strings for alignment will not be allowed. The alignment laser shall be of a type and manufacture especially suitable to the construction of sewers and the instrument shall provide a target which shall insure an instant and continuous visual check on the instrument alignment. A competent and skilled superintendent or operator for the laser beam instrument shall be on duty at all times.

- (e) Backfilling--After the sewer pipe has been properly positioned for grade and horizontal alignment the trench shall be filled with embedment material from the subgrade to a level at least 12 inches above the top of the pipe. The embedment material shall meet MDOT Class 2 with particle sizes less than 1.5 inches in diameter, compacted to 95% of maximum unit weight. Backfill for the remaining unfilled portion of the trench shall be in accordance the Drawings and/or

Specifications.

- (e-1) Class A Backfill--Backfilling under this designation shall consist of furnishing and placing MDOT Class 2 granular material in 12-inch layers, compacted to 95% maximum unit weight as determined by the latest A.A.S.H.T.O. methods, for the entire depth of the trench. Contractor shall be responsible for damages to pipe during backfilling. Unless otherwise provided for in the Bid Proposal, the cost of furnishing and placing and compacting the required granular material shall be included in the unit price for sewer construction and no additional payment will be allowed.
- (e-2) Class B Backfill--Backfilling under this designation shall consist of backfilling the trench from 12 inches above the top of the pipe to the top of the trench, with selected material excavated from the trench, compacted with heavy construction equipment in layers not exceeding 24 inches in depth. Backfilling shall be done by ramping the backfill down the trench to provide compaction by the heavy equipment at all levels of the backfill as required by the Engineer. Where trenches are too narrow in width to provide access by heavy equipment other methods and equipment shall be used to achieve the required degree of compaction. Contractor shall be responsible for any damages to pipe during backfilling.

Stones exceeding six (6) inches in diameter, logs, stumps and other debris shall not be allowed in the backfill material. Muck or other unstable organic soils which may be encountered in excavation shall be hauled and disposed of and the Contractor shall furnish sufficient approved material to complete the backfill as required. Surplus excavated material shall be hauled and disposed of in accordance with the requirements in the Specifications and Drawings.

Granular material which is encountered in the excavated material may be used for the required MDOT Class 2 granular material if approved by the Engineer. The use of such material shall not be allowed without prior approval of the Engineer.

Any depression resulting from settlement of the trench backfill previous to the date of final acceptance of all work under this contract shall be brought to the proper grade and the surface made to match the adjacent surface as specified heretofore.

- (f) Backfilling Around Structures -- As soon as practicable after concrete structures have been set, forms and debris have been removed, the surface of the concrete pointed up, the structure have been inspected and approved, the excavated area around structures shall be backfilled up to the specified grade as specified below for trenches. No large boulders or masonry shall be placed in backfilling within one (1) foot of any part of the structures.

Under all gravel, bituminous or concrete surfaces of roads, parking areas and

driveways, the trench shall be backfilled completely with sand placed in layers not exceeding 12 inches in thickness and compacted to not less than 95% of its maximum dry unit weight using mechanical compactors.

On all gravel surfaces, the Contractor shall place 6 inches of compacted 100% crushed limestone to the finished grade. On all bituminous and concrete surfaces, the Contractor shall repair the pavement in accordance with MDOT 2012 Standard Specifications.

The Contractor shall maintain all road and driveway crossings in suitable repair. Settlements shall be promptly repaired at all times. Legitimate complaints received by the Contractor shall be checked and necessary repairs made within 24 hours of the time received or the Owner shall make the necessary repairs and deduct the cost thereof from any payment due to the Contractor.

Where sewers are constructed in tunnel under concrete pavements or railroad, clean sand mixed in proportions to one sack of cement per two cubic yards of sand shall be tamped around the pipe to the roof of the tunnel. Shoring and bracing used to support the tunnel shall be removed as the backfill is tamped in place.

Where sewers are constructed by boring an opening and pushing the pipe through the tunnel, the annular space around the pipe shall be filled with pea stone. Pea stone may be blown into the space or placed around the sewer pipe and be pulled through the opening as the sewer is being installed.

Sand, where called for in these Specifications, shall be a good grade of natural bank sand or gravel which meets the requirements of MDOT Class II Granular material.

- (g) Repair of Structures and Underground Piping -- Crosswalks, curbs, gutters, sidewalks and private walks, driveways and underground piping cut or damaged shall be rebuilt and left in first class condition fully equal to their condition before being disturbed. If a square or block of sidewalk is cracked or broken, the entire block or square shall be removed and replaced using Class A concrete. Where the sewer parallels an existing bituminous or concrete pavement, special care shall be taken by the Contractor to prevent any damage to the pavement. Pavements damaged as the result of the construction operations, shall be rebuilt to a condition fully equal to their condition prior to the sewer construction. The cost of such structure and piping repair shall be included in the unit price bid per foot of sewer.

The Contractor shall be responsible for all existing sewer, water, gas, telephone and other underground piping or conduits encountered in the line of work. He shall repair or replace at his own expense any such piping which is damaged or cut by his operations. Where utility service pipes are cut by the Contractor to

facilitate his work, he shall repair same as quickly as possible so that the Owner will not be inconvenienced more than necessary.

- (h) Use of ASTM Construction Specifications. --ASTM Designation C12, 2680, 2751 and 3034 are a part of these Specifications and are binding upon the parties signatory to this Contract described as follows:

Plastic Sewer Pipe shall be installed in accordance with ASTM except wherein modified by these Specifications. If ASTM shall be in conflict with other provisions of these Specifications, then the provisions of these Specifications shall govern.

Vitrified Clay and Concrete Sewer Pipe shall be installed in accordance with ASTM C12 except wherein modified by these Specifications. If ASTM C12 shall be in conflict with other provisions of these Specifications, then the provisions of these Specifications shall govern.

The Engineer shall, in all instances, be the final judge as to whether the aforesaid ASTM designations for construction provisions shall govern or whether these provisions have been modified by specific sections of these Specifications. In no instance, however, shall provisions of any items of these Specifications be judged to relax or negate requirements of the ASTM Specifications if, in the judgment of the Engineer, the quality of construction will therein be reduced.

6. Service Leads

In order to mark the location of unconnected tees and service leads connections, the Contractor shall make accurate measurements of all wyes and tees and service leads before the trench is closed. The Contractor shall keep a record of the distance of each Tee or Wye and each service connection from the nearest downstream manhole and his record shall be furnished to the Engineer upon request. The Contractor shall also mark each unconnected Tee and Wye and service connection by placing a four-inch by four-inch cypress, ash, or cedar marking stick which shall extend in a vertical direction upward from each unconnected branch or service connection to within six (6) inches of the street surface. A number 4 rebar extending to the invert of the capped service lead, terminating 6 inches below finished grade shall also be left to mark the lead location.

Service leads shall be constructed as a part of the construction of each sewer line and in accordance with these Specifications so that each street can be opened to traffic as soon as backfilling of the sewer trench is completed.

After each section of new sewer has been tested and approved, the Contractor shall connect all existing service leads to the new sewer. Connection of existing sewers to the new sewer before testing will not be allowed.

When sidewalks are encountered in bringing service leads to property lines, the Contractor may tunnel under the sidewalks to the property line or may remove and replace the sidewalk at the point of crossing. In either case, backfilling shall be tamped to a condition which insures that no settlement of the sidewalk shall take place. New service leads shall be constructed from the public sewer to the property line.

Each existing home and business place will be considered by the Owner or his representative to determine the location of the connection point for the service. Each home and business place shall be provided a properly constructed service lead.

- (a) Service Lead Construction--Whenever shown on the Drawings or as directed by the Engineer, the Contractor shall furnish and lay 6-inch service leads. They shall consist of the same type of pipe and joint material as the regular sewer. The pipe shall be laid on a grade of 0.6 percent and closed with a stopper. Stoppers shall be furnished with premium type water tight joints of the same type as the regular sewers.
- (b) Wye Branches. --The Contractor shall furnish and place, where indicated on the Drawings or as directed by the Engineer, 6-inch wye connections. For vacant lots, the opening shall be securely closed with a stopper set in place.
- (c) Deep-Cut Connections. --In all depths over 12 feet, a 45-degree long radius elbow and sufficient 6-inch pipe set vertically to bring the top of the riser to within 8 feet of the surface shall be provided. On the riser shall be a 6-inch 45 degree elbow closed with a stopper. The riser shall be supported by tamped porous material as shown on the Drawings. The price bid for deep-cut connections shall include both elbows, straight pipe and porous material.
- (d) Manhole Connections - Where called for on the Drawings or as directed by the Engineer, service leads shall be connected to manholes. For sanitary sewers, such connections shall be field cored; installed to a water tight condition; internal drop pipe installed if the service lead invert is greater than eighteen inches above the main sewer flow line as detailed on the Drawings; and the flow channels shaped to assure smooth hydraulic flows. For storm sewers, such connections may be field cored or opening otherwise made into the manhole with care not to damage structural integrity and the connection pipe grouted in place.

For vacant lots or where service leads are not immediately run, the opening shall be securely closed with a stopper set in place.

7. Manholes

The following specifications shall govern the construction of manholes:

- (a) Manholes. --Manholes shall be constructed at the points shown on the Drawings. All materials and work of construction shall conform to MDOT 2012 Standard Specifications except as herein specified. Frames and covers shall be as designated on the Drawings. All rings shall be firmly and evenly bedded in cement mortar. Approved non-corrosive or plastic steps shall be provided. Manholes shall be built to conform to details shown on the Drawings and Specifications. For manholes, pre-cast bases shall be required, and manholes shall be evenly bedded in cement mortar, with special care for insuring that the manhole and manhole base are dry until mortar has thoroughly set. Use of frames, covers and steps shall be as provided for on the Drawings or as listed in the Specifications. Manholes for sanitary sewers shall be precast concrete and shall be provided with an approved water tight rubber joint gasket system for connection of each pipe section. A permanent heavy-duty rubber gasket sleeve shall be provided in core drilled opening of sufficient size to incorporate the gasket, stainless steel retainer ring and pipe.
- (b) Drop Manhole Connections. --The Contractor shall furnish, and place drop manhole connections as shown on the Drawings or as directed by the Engineer.
- (c) Flow Lines. --All manholes shall be constructed in such a manner as to insure flow through them without splashing on sides or deposition of solids. The construction of smooth flow lines in manholes is an important part of this project. The Engineer will require poorly constructed flow lines to be rebuilt as required. All concrete surfaces inside manholes shall be screened and floated to a smooth, uniform surface and troweled to a hard finish. Flow through manholes shall be in sewer pipe or in channels formed in the concrete manhole floor. For junction-manholes, channels shall be constructed of split pipe or split wyes or double-split wyes or shall be constructed by forming the concrete manhole floor to flow channels of the same shape and dimensions as the required split pipe, wyes, and double wyes. The use of shallow, or poorly formed channels in junction manholes or in manholes requiring a change in pipe direction will not be allowed.
- (d) Leaky Manholes. --No leakage or infiltration into manholes shall be accepted and the Contractor shall construct manholes in such a manner as to exclude all ground water. Special measures for insuring watertight construction will be required in wet areas and manholes shall at all times be constructed under dry conditions, with dewatering, as required. Concrete floors and flow lines for manholes shall be poured under dry conditions and each manhole shall be dewatered by well points or other measures in wet areas for a period of at least 24 hours after placing of concrete. Inlet and outlet sewer lines shall be bedded adjacent to manholes for insuring that no damage to the pipe will result from backfilling. Special care shall be required for service risers and for drop manhole connections. No settlement or shearing of the pipe will be acceptable.

Provide manholes, risers, inlet and outlet lines and drop manhole connections that are bedded, compacted and supported to prevent the infiltration of ground water into the sewer system. Payments for leaky manholes will be withheld until manholes are properly repaired.

- (e) Bulkheads and Plugs -- In locations where bulkheads or plugs are called for on the plans, the Contractor shall install an inflatable or mechanically expanded plug or a brick bulkhead in the sewer under construction. Plugs shall be braced and secured to resist the full hydrostatic pressure on either side of the plug or bulkhead. Plugs or bulkheads shall not be removed without the express permission of the Engineer.
- (f) Catchbasins. --Catchbasins shall be constructed as shown on the Drawings. All materials and work of construction shall conform to MDOT 2012 Standard Specifications. Frames and grates shall be as designated on the Drawings.
- (g) Catchbasin Leads. --Catchbasins shall be connected to manholes with the size and class of pipe designated on the Drawings. They shall be laid on a minimum grade of one (1) per cent where the depth of the sewer permits.

8. Contractor's Responsibility for Utilities

In addition to the requirements in the General Conditions and the Standard Project Requirements relating to existing utilities, the Contractor shall observe the following requirements in relation to specific utilities.

- (a) Watermains. --It is believed that the elevations of watermains are such that they will not conflict with those of the sewer. The Contractor shall notify the Owner at least 48 hours before he intends to cross an existing water main. In case a main is damaged through the neglect of the Contractor or his workmen, the Contractor shall cause immediate repairs to be made at no expense to the Owner. Backfilling from the bottom of the trench to a level 6 inches above the top of the main in 6-inch layers thoroughly tamped. In addition, when directed by the Engineer, the Contractor shall truss the watermain as shown on the Drawings. In case it is necessary to move a watermain, the Owner will perform the work as expeditiously as possible without expense to the Contractor.
- (b) Water Services. --The Owner will endeavor to locate existing water service lines for the Contractor. The Contractor shall take proper precautions to protect water service lines and if damaged, said service lines shall be promptly repaired by the Contractor at no expense to the Owner.
- (c) Gas Mains. --The Contractor shall contact the local gas company for assistance in locating gas mains and service pipes.

The Contractor shall make all necessary arrangements with the gas company for supporting gas mains which may interfere with trenching and shall use every care for avoiding damage to gas lines.

If it is discovered that a gas main interferes with the proposed location of a sewer line, the Contractor shall notify the Engineer at once in order that provisions may be made for moving the gas main or changing the sewer location. The local gas company has been furnished with Drawings for the sewers and has checked these Drawings to determine that proposed sewer lines are not located in the same street area as gas lines. Cooperation with the gas company and with the Owner in adjusting any interference between gas and sewer lines is an important part of this contract and the Contractor shall provide this cooperation at no expense to the Owner except in specific instances when, in the judgment of the Engineer, changes result in extra costs to the Contractor. If a gas main is damaged, the Contractor shall immediately contact the gas company and provide every assistance in repairing the main promptly. If gas lines must be moved, the cost of moving will be negotiated between the Owner and the gas company at no expense to the Contractor.

- (d) Gas Services. --The Contractor shall ask the local gas company to locate gas service connections and it shall be the Contractor's responsibility to request this assistance when it is required. The Contractor shall take proper precautions to protect gas service lines and if damaged, shall assist the gas company in restoring service at no expense to the Owner.
- (e) Fire and Explosions from Damaged Gas Lines. --Because trenching for sewers results in danger from damage to gas lines and resultant fires and explosions, the Contractor shall take special measure to avoid these hazards and shall save the Owner harmless from all damages to persons or property in event such fire or explosion should occur. Protection of the Owner from damage costs from gas and fire explosion occurring during construction are an important part of this contract and the Contractor shall provide this protection by a clause in his Public Liability and Property Damage Insurance.
- (f) Telephone Lines, Poles and Cables. --The Contractor shall contact the local telephone company before beginning any trenching to ensure that no telephone cables are damaged.

The Contractor shall additionally insure that telephone poles which are endangered by his trenching are properly supported and shall cooperate with the local telephone company in avoiding damage to telephone lines and poles.

- (g) Power Lines. --The Contractor shall contact the local power company before beginning any trenching in order to avoid damage to power lines and poles. The

Contractor shall insure that power poles which are endangered by his trenching are properly supported and shall cooperate with the power company in avoiding damage to power lines and poles. Special care shall be taken to avoid danger to or from high voltage lines within the construction areas and the Contractor is cautioned to provide safeguards against danger from high voltage lines.

- (h) Existing Sewers. --In general, new sewers will not conflict with existing sewers. When sewer trenches cross under existing sewer lines, the Contractor shall backfill with sand to one foot above the top of the existing sewer. This sand shall be placed in six-inch layers and each layer thoroughly compacted to 90% of maximum unit weight. If existing sewers are damaged during construction, they shall be immediately repaired at the Contractor's expense. Existing sewer or sanitary sewers which are intercepted by a new storm or sanitary sewer shall be connected to the new sewer respectively when required by the Engineer.

When new sewers connect to existing sewers at manholes, the downstream end of the new sewer shall be plugged during the construction period and until the new sewer is inspected, cleaned if necessary, and otherwise accepted by the Owner. Appropriate measures are to be taken to assure construction debris, dirt, ditch water, etc. are not allowed into the existing sewer.

When new sewer leads are to be cut into existing sewers, the tap shall be made by drilling a round hole with a diamond and/or carbide cutter. An approved saddle appropriate to the size and material of the existing sewer is to be utilized. Such taps to be made in the presence of the Engineer or Owner.

- (i) Private Property Sewers. --Whenever a sewer crosses private property the premises shall be restored, as nearly as practicable, to the condition existing before work was started.

9. Well Pointing

The Bidder shall make his own investigation as to the necessity for well pointing and adjust his bid price per lineal foot of sewer accordingly. No extra payment will be allowed for well-pointing.

10. Inspection and Tests for Sanitary Sewers

After all sewer and manhole construction under this Contract is completed, the sewers and manholes shall be inspected and tested in accordance with the following requirements:

- (a) Video Tape Inspection. --After completion of all sewer construction and prior to final acceptance of the sewer line, the entire length of sewers under this Contract

shall be videotaped by competent and experienced sewer videotaping technicians as described below.

The Contractor shall furnish all labor, electronic equipment and technicians to perform the videotaped color inspection of the sewers. Operation of the equipment is to be controlled from above ground with a skilled technician at the control panel controlling the movement of the video camera.

The technician shall have the capability to adjust the brilliance of the built-in lighting system and must be able to change the focus of the video camera to insure a clear picture.

Electricity for all operations, and a ventilating system, if required to improve the quality of the video tape inspection, shall be furnished by the Contractor.

Video equipment shall consist of a self-contained camera and a monitoring unit connected by a coaxial cable. The camera shall be small enough to insure passage through an 8-inch diameter sewer, shall be waterproof, and shall have a self-contained lighting system capable of producing at least 100 foot-candles of light. Picture quality shall be such as to produce a continuous 600-line resolution picture showing the entire inside periphery of the pipe.

The videotaped inspection shall be performed on one section (between adjacent manholes) at a time. Each section being inspected shall be isolated from the remainder of the line by the use of a line plug to insure total viewing of the inside periphery of the pipe. The inspection shall be performed by pulling the video camera through the line along the axis of the pipe by use of a wire cable. The inspection shall be performed in a forward and/or backward direction, according to line conditions at the time the inspection is made.

During the videotaping operation an inspection record shall be kept which will show clearly the exact location, in relation to the center of the adjacent manhole, of each point of infiltration or pipe defect discovered by the inspection. To insure accurate measurement, the measurement shall be made from an object a fixed distance in front of the video camera which is positioned at the location of the leak or failure. The measurement reading shall be made and recorded by the video camera, during the inspection. Marking on a cable or the like which would require the inspector to be in the manhole or which would require interpolation for the depth of the manhole will not be permitted.

Prior to beginning videotaping any run of sewer, a data screen shall be shown. The data screen shall provide at a minimum the following information:

1. The Name of the Project
2. The Name of the Installing Contractor

3. The beginning manhole number (as shown on the contract plans) and the ending manhole number (as shown on the contract plans).
4. The project location/owner's name.
5. The date of the videotaping.

While the video taping of the sewer is in progress, a running footage of distance traveled from the beginning manhole shall be displaced on screen. A voice over narration shall describe any notable differences in the sewer. These differences shall include but not be limited to abrupt changes in grade, wide joints, water or debris in the pipe.

During the video tape inspection operation, the Contractor shall take Polaroid pictures of the video monitor showing typical sewer defect or sewer joints. A minimum of four pictures per run shall be made; a run being considered from manhole to manhole, or manhole to obstruction as the case may be. All defective joints, other pipe defects, leaking joints, submerged areas and any questionable areas shall be photographed to provide a permanent record.

A written record or log shall be kept of the exact location of all service connections, root growth, crushed or broken pipe, cracked pipe, irregular pipe alignment or grade, and points of infiltration including reference to quadrant of pipe in which leakage occurs. The points where the camera goes into the water and out of the water must be recorded for each section videotaped. Sections of sewer which have dips causing the camera to be submerged for periods of time shall be dewatered and re-videotaped to determine the condition of the sewer line in areas of submergence. Two written logs and one (1) VHS formatted video tape (bound in notebooks for permanent records) shall be submitted to the Owner for review.

Payment for videotaped inspection shall be considered incidental to sewer construction and no additional payment will be allowed, therefore.

Joints or manholes which are found to be leaking at time of video tape inspection may be repaired at time of video tape inspection by "grouting". Such grouting repairs shall be made in accordance with good practices for this type of sewer repair work and by methods acceptable to the Engineer. Cost of all grouting and sealing or other repairs will be at the cost of the Contractor.

The Owner may make such investigations as he deems necessary to determine the ability of the technician to perform the work, and the Contractor shall furnish to the Owner all such information and data for this purpose as the Owner may request. The technician shall have a minimum of 5 years' experience in video taping of sewer lines. The technician (individual or sub-contractor) shall be acceptable to the Engineer and must be approved by the Engineer before beginning the videotaping inspection.

- (b) Tests For Leakage. --All sewers constructed under this Contract shall be subjected to tests to prove that leakage is not present.
- (b-1) Low Pressure Air Test -- The Contractor shall air test all of the sewer lines after backfilling the trenches and shall furnish all personnel and equipment required to perform the tests. The Contractor may, at his option, air test any or all of the sewer lines prior to backfilling. However, such tests will be in addition to the required test following the backfilling of the trench.

The air control equipment shall have the necessary gages and valves to control the rate at which air flows into the test section. The gages which monitor the air pressure in the test section shall have minimum graduations of 0.1 psi.

With this method of testing, the sewer lines shall first be cleaned of all dirt and debris by propelling a snug fitting inflated rubber ball through the pipe with water. All pipe outlets shall then be plugged with suitable test plugs and each plug braced securely. If the pipe to be tested is submerged in ground water, a pipe probe shall be inserted by boring or jetting into the backfill material adjacent to the center of the sewer, as air passes slowly through the probe the pressure can be determined. This pressure is the back pressure due to ground water submergence over the probe end.

All pressures in the test equipment should be increased by an equivalent amount to offset this groundwater pressure. Air shall then be slowly added to the portion of pipe installation under test until the internal air pressure is raised to 4.0 psig. After an internal pressure of 4.0 psig is obtained, at least 2 minutes shall be allowed for air temperature to stabilize and air shall be added only in the amount required to maintain 4.0 psig. When pressure decreases to 3.5 psig, a stop watch shall be started to determine the time in seconds that is required for the internal air pressure to reach 2.5 psig. Minimum permissible pressure holding times for runs of single pipe diameter are indicated in the following tables, in seconds. Sections of sewers which do not meet these required holding times shall be repaired as required and retested until satisfactory results are obtained.

The air test may be dangerous if, because of ignorance or carelessness, a line is improperly prepared. It is extremely important that the various plugs be installed and braced in such a way as to prevent blow outs. In as much as a force of 250 lbs. is exerted on an 8" plug by an internal pipe pressure of 5 psi, it should be realized that sudden expulsion of a poorly installed plug or of a plug that is partially deflated before the pipe pressure is released can be dangerous.

As a safety precaution, pressurizing equipment should include a regulator or relief

valve set at perhaps 10 psi to avoid over-pressurizing and damaging an otherwise acceptable line. No one shall be allowed in the manhole during testing.

- (b-2) Infiltration Test -- Before acceptance of the work, and at the option of the Owner, the Contractor may be required to conduct an infiltration test. This test shall be based upon natural conditions of groundwater existing at the time. The Contractor shall provide all equipment, materials and labor required for the test.

The maximum rate of infiltration which will be permitted is 200 gallons per inch diameter per mile of pipe per 24 hours, including services. If infiltration is more than this rate for any section of sewer between manholes, the Contractor shall be required to locate and remedy the defects in construction causing the infiltration; and the test shall be performed again on any section failing the initial infiltration test. Sections, or the system, will not be accepted, until a satisfactory infiltration test is obtained.

All visible leakage in sewers or manholes shall be repaired, even though air tests and infiltration tests may have been satisfactory.

- (c) Deflection Testing for Flexible Pipe shall be required for all flexible pipe installed. This test shall be done 30 days after pipe installation. The pipe shall be tested by use of a mandrell of appropriate size. A maximum deflection of 5% shall be allowed. PVC and ABS Truss Pipe are flexible pipe.

This section does not pertain to storm sewers.

11. Maintaining Traffic

The Contractor shall maintain all safety measures, including lights and barricades for proper protection of his work and for safety and he shall at all times pursue his work in such a manner as to cause a minimum of interference to residents adjacent to the construction. Whenever possible, he shall provide ingress and egress to the residents adjacent to the improvement, school busses and the United States Mail. Traffic shall be maintained in accordance with the Contract Documents.

The cost of maintaining all traffic, including lights, signs, barricades, watchmen, and constructing and removing temporary roads shall be incidental to this Contract and no payment will be allowed therefore unless provided in the Proposal.

12. Fine Grading and Cleanup

Before final acceptance of the work, the Contractor shall remove all excess excavation and debris from the site and shall neatly fill and fine grade the construction area. The Contractor shall also as nearly as practicable, restore to their original condition all lawns, shrubbery, and trees.

13. Measurement for Payment for Sewer Construction

When set forth in the Bid Proposal, the following methods shall be used to establish payment for work completed and accepted under this contract. When the following items are part of the project and not set forth in the Bid Proposal, they shall be deemed included within other items of work.

- A. Sanitary Sewers--Sanitary sewers will be paid for at unit price bid for each size and classification of pipe. Unit price to include all incidental items including testing and television inspection as required in the specifications. Unit price for each depth classification shall be at the average depth of the pipe invert below the finish ground surface measured at the two manholes located at both ends of the installed pipe and at the midpoint between the two manholes.
- B. Storm Sewers--Storm sewers will be paid for at the unit price bid for each size and class of pipe. Unit price shall include all incidental items as required in the specifications. Catch basin leads shall be paid for as storm sewers.
- C. Manholes catch basins or Inlets--Payment for manholes will be made for the number of units bid at the unit price each times the actual number of manholes. Castings shall be included in the cost of manholes, catch basins or inlets.
- D. Additional Depth of Manholes--Added depth for manholes, when bid separately over the standard depth as specified for manholes in the bid proposal, shall be paid for at the unit price bid per vertical foot times the total number of additional feet constructed. If not bid separately, cost for additional depth of manhole shall be included in the bid price for manholes.
- E. Manhole Castings or Catch basin Castings--Manhole castings shall be included in the cost of manholes, catch basins or inlets.

- F. Deep Cut Risers--Payment will be made for the number of units-built times the unit price bid. Payment shall include all necessary fittings and pipe to construct the riser from the sanitary sewer to the point of connection to the horizontal sanitary house service.
- G. Drop Manhole Connections--Payment for drop manhole connections will be made at the unit price bid times the number of units built.
- H. Furnishing and Placing Wyes--Wyes will be paid for at the unit price bid each times the actual number of wyes furnished and placed.
- I. Sanitary House Services--Payment for sanitary house services will be per lineal foot constructed, measured from the center of the sanitary sewer to the end of the sanitary house service, or where deep cut risers are furnished, measurement shall be from the inlet end of the riser to the end of the sanitary house service or to its connection to an existing sewer.
- J. Connecting Existing Sanitary Sewers--Payment will be made at the unit price times the actual number of forcemains connections completed.

NCPI AIR TEST TABLES
MINIMUM HOLDING TIME IN SECONDS
FOR PRESSURE TO DROP FROM 3-1/2 TO 2-1/2 PSIG

PIPE DIAMETER															
		4"	6"	8"	10"	12"	15"	18"	21"	24"	27"	30"	33"	36"	39"
L	25	4	10	18	28	40	62	89	121	158	200	248	299	356	418
E	50	9	20	35	55	79	124	178	243	317	401	495	599	713	837
N	75	13	30	53	83	119	186	267	364	475	601	743	898	1020	1105
G	100	18	40	70	110	158	248	356	485	634	765	851	935		
T															
H	125	22	50	88	138	198	309	446	595	680					
	150	26	59	106	165	238	371	510							
O	175	31	69	123	193	277	425								
F	200	35	79	141	220	317									
L	225	40	89	158	248	340									
I	250	44	99	176	275										
N	275	48	109	194	283										
E	300	53	119	211											
I	350	62	139	227											
N	400	70	158												
F	450	79	170												
E	500	88													
E															
T	500	97													
	600	106													
	650	113	170	227	283	340	425	510	595	680	765	851	935	1020	1105

NOTE: To be used when testing one diameter only.

PLASTIC PIPE AIR TEST TABLES
SPECIFICATION TIME REQUIRED FOR A 1.0 PSIG PRESSURE DROP
FOR SIZE AND LENGTH OF PIPE INDICATED FOR Q = 0.0015
ALLOWABLE PRESSURE DROP 4 - 3 PSIG

1 Pipe Diameter (in.)	2 Minimum Time (min:sec)	3 Length for Minimu m Time (ft)	4 Time for Longer Length (sec)	Specification Time for Length (L) Shown (min:sec)								
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft	
4	3:46	597	.380L	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6	5:40	398	.854L	5:40	5:40	5:40	5:40	5:40	5:40	5:40	5:42	6:24
8	7:34	298	1.520L	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24	
10	9:26	239	2.374L	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48	
12	11:20	199	3.418L	11:20	11:20	11:24	14:15	17:05	19:56	22:47	25:38	
15	14:10	159	5.342L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04	
18	17:00	133	7.692L	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41	
21	19:50	114	10.470L	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31	
24	22:40	99	13.674L	22:47	34:11	45:34	56:58	68:22	79:46	91:10	102:33	
27	25:30	88	17.306L	28:51	43:16	57:41	72:07	86:32	100:57	115:22	129:48	
30	28:20	80	21.366L	35:37	53:25	71:13	89:02	106:50	124:38	142:26	160:15	
33	31:10	72	25.852L	43:05	64:38	86:10	107:43	129:16	150:43	172:21	193:53	
36	34:00	66	30.768L	51:17	76:55	102:34	128:12	153:50	179:29	205:07	230:46	

NOTE 1: To be used when testing one diameter only.

NOTE 2: Consult with pipe and appurtenance manufacturer for maximum test pressure for pipe size greater than 30 in. diameter.

STREET IMPROVEMENTS

1. Scope of the Work

Work under this section of the specifications shall include all excavation, filling and compaction and other sub-base preparation for bringing streets and roads to designated levels, together with curbs, curb and gutter, tree removal, sidewalks, retaining walls, culverts; the placing of hot asphalt base and hot asphalt wearing course or placing MDOT 22A gravel base and bituminous asphalt wearing course and all other construction shown on the plans and listed on the Bid Proposal. All work is to be done in accordance with the following specifications and the specific requirements of the Special Conditions section of the Specifications.

2. Excavation, Filling, and Grading

Excavation shall consist of all work required to be done to construct the subgrade true to line, elevation and cross-section called for on the plans and in accordance with these specifications. All excess excavated materials, except such as is suitable for making fills, shall be removed from the site and disposed of as required in the Special Conditions of these Specifications. Such material shall not be left in piles but shall be leveled. Excavation shall be carried to such a depth as to allow the placement of the specified depth of aggregate base and bituminous concrete surface or the placement of the specified plant-mix asphalt base and bituminous concrete surface to the elevations shown on the plans. Final grading shall be done after curb and gutter is in place. The quantity for excavation and grading as listed in the proposal is a station basis quantity, a station being 100 lineal feet of street, both sides included. The said quantity of stations will be considered as the basis of final payment for excavation grading and sub-base preparation item, provided that no changes in grade elevation from the planned cross-sections, which are included in the plans, are ordered by the Engineer. Excavation includes the removal of existing bituminous pavement and disposal of the same as directed by the Owner. No extra payment will be allowed for such removal and disposal. No broken concrete or bituminous slabs will be allowed in the fills. Fill dirt shall be placed in not more than 9-inch layers thoroughly compacted to 95% of the soils maximum unit weight. The work of excavation, filling, and grading includes making all fills indicated on the plans and in accordance with the cross-sections or as directed by the Engineer.

3. Removal of Existing Structures

All existing curb, curb and gutter, culverts, headwalls, sidewalks, bituminous pavement or concrete pavement, driveways, old catchbasins or manholes, or any structures and items not incorporated into the new work shall be removed where shown on the plans or as directed by the Engineer. Disposition of the removed material shall be as directed by the Owner. Removal shall be incidental to earthwork and grading and no payment shall be allowed unless specifically provided for in the Bid Proposal.

4. Structural Concrete Construction

Structural concrete construction shall conform to the requirements of MDOT 2012 Standard Specifications. All materials for structural concrete shall meet the requirements of the appropriate section of the MDOT 2012 Standard Specifications. Concrete shall be MDOT S1, 4000 psi @ 28 days, 6AA aggregate unless otherwise noted on the plans.

5. Removing Trees and Stumps

The Contractor shall remove all trees and stumps as directed by the Engineer and properly dispose of the material. Stumps and roots shall be removed at least 2 feet below the level of the finished surface. Depressions made on account of stump removal shall be filled with compacted Class II granular material.

6. Curb and Gutter

The method of forming for concrete curb and gutter shall be at the option of the Contractor, except where required in the Bid Proposal, an alternate bid is provided for forming curb and gutter with conventional steel forms in accordance with the MDOT 2012 Standard Specifications.

When an alternate bid is provided in the Bid Proposal, the Contractor is required to submit such alternate bid and the election of method for forming shall be by the Engineer. Steel forms used for conventionally formed curb and gutter shall be straight, true and clean and subject to the approval of the Engineer.

Where slip forming is used as a method of construction of curb and gutter, the Contractor shall use such methods and procedures to insure an extruded curb and gutter which is true to line, grade and cross-section, free from sags or slumps. Curb and gutter with defects and poor workmanship and poor appearance may be required to be removed and replaced at the Contractor's expense.

Excavation for curb and gutter shall be carried four (4) inches below the base of the structure. The Contractor shall furnish and place four (4) inches of porous material under the curb.

Requirement for 4-inch sand cushion under new concrete curb and gutter will be deleted where new curb and gutter is installed by slip-form methods and where sub-grade is finished automatically and accurately in one operation with slip-forming. Any unstable areas under new curb and gutter shall be removed and corrected prior to curb and gutter construction.

The construction methods for curb and gutter shall conform to the requirements of MDOT 2012 Standard Specifications. All materials for curb and gutter shall meet the requirements of the appropriate section of the MDOT 2012 Standard Specifications. Concrete shall be MDOT P1 3500 psi @ 28 days, 6AA aggregate.

The Contractor shall furnish the Engineer with sufficient concrete test cylinders to allow one for each 500 lineal feet of curb and gutter. Curb details shall be as shown on plans.

The Contractor shall place one-half inch steel bars in the curb and gutter as shown on the plans. All bars shall be lapped not less than 10 inches. Bars shall not extend through expansion joints.

Premolded bituminous expansion joints, ½ inch thick shall be placed at all intersections of sidewalks, where sidewalks meet curb and gutter or driveways and every 50 feet of sidewalk.

Concrete sidewalk shall be uniform 4-inch thickness except at driveways where the sidewalk shall be 6 inches thick for the full width of the driveway. Sidewalk shall not be reinforced unless required on the plans.

Sidewalks shall be constructed to lines and grades as set by the Engineer or in accordance with the Engineer's instructions where existing walks, curb and gutter or other structures control the location and elevation of the new walk. Sidewalks shall be neatly marked and edged in accordance with good practice and according to instructions by the Engineer. A light broom finish shall be provided unless the Contractor is instructed otherwise.

7. Ramps for Handicapped Persons

The Contractor shall construct at all locations shown on the Plans or required by the Engineer, ramps for the physically handicapped persons. Ramp details shall conform to the requirements of the Michigan Department of Transportation Standard Plans and other applicable state laws. Concrete for ramps shall be as required for concrete sidewalks and shall be constructed to a depth of 6 inches. Ramps shall be installed at all intersection locations and for both standard curbs and roll type curbs. Ramps shall not exceed a maximum slope of 1 foot vertical in 12 feet of horizontal length. A maximum of 1-inch lip shall be provided at the gutter line.

8. Sub-Base Preparation

After rough grading the sub-base and before placing the hot-mix asphalt base or gravel base, the sub-base shall be scarified to a depth of 12 inches, bladed, blended and rolled to a true cross-section within (plus or minus) 0.05 foot of the specified detail. The subgrade soils shall be blended and manipulated as necessary to the satisfaction of the engineer to eliminate all abrupt changes in soil types across and along the street. The sub-grade shall be compacted to a minimum of 95% of the soil's maximum unit weight. After thorough compaction it shall be proof-rolled with a single axle dump truck loaded to produce an 18,000 lb. rear axle load. A deflection or depression of more than one-half (½) inch under the rear wheels shall require additional subgrade manipulation and compaction. The Engineer may require additional soils density tests to be made to determine the compaction of the sub-grade. The Contractor shall give the Engineer 48 hours' notice before beginning proof-rolling. The sub-grade shall be approved by the Engineer prior to placement of base course materials.

Where unstable soils such as peat, muck, marl, soft clay or soils which contain an excess percentage of moisture are encountered in the sub- grade, the Contractor shall stabilize the sub-grade in accordance with instructions by the Engineer by one of the following methods:

- a. Undercutting the sub-grade by excavation below the sub-grade elevation and filling with compacted granular material or other approved borrow fill. All fill material shall be placed and compacted to meet the compaction requirements above. Excavation shall be to the depth and width determined by the Engineer.
- b. Aerating the sub-grade soils by discing, harrowing, or scarifying to a depth sufficient to reduce the moisture content to within the optimum limit to permit the required compaction. This method shall be used for soils which are saturated or of a plastic nature because of an excess of moisture content, but which are stable under normal conditions. After aeration of the soils is complete and the moisture content has been reduced to within optimum limits, the subgrade shall be compacted and regraded to the proper cross-section.
- c. Stabilizing saturated or plastic clay areas by adding hydrated lime. Hydrated lime shall be applied to the affected areas at the rate of approximately 20 lbs. per square yard, and disced, or mixed by rototiller, grader or other equipment so as to blend the lime uniformly in the top 6 to 8 inches of the subgrade material. Water shall then be added, and mixing continued until the 6-inch layer is friable and in a condition suitable to compact to the required stability for proof-rolling. Stabilization with lime shall be restricted to clay soils only.

The Contractor shall be responsible for providing a completely stabilized subgrade, compacted and graded in accordance with the plan cross-sections. Intermediate grading and compaction of the subgrade may be required during construction of pavement base course to eliminate rutting and displacement and shall be done routinely to provide a stabilized subgrade during base course construction. Approval of the subgrade by the Engineer shall not relieve the Contractor of the responsibility for providing a completely stabilized and compacted subgrade. Payment for sub-base preparation shall be incidental to the earthwork and no extra payment shall be allowed for any work described in this section unless specifically provided for in the Bid Proposal.

9. Adjusting Street Castings

All manhole, catchbasin, water valve and other utility castings lying within the roadbed shall be adjusted after leveling and before wearing course. The castings shall be adjusted to the elevation and cross-section of the finished pavement surface. The castings shall be set in a full mortar bed around the circumference of the frame which shall result in a water-tight joint between the casting frame and the masonry below. Catchbasin castings shall be properly adjusted prior to placement of concrete curb and gutter. Water valve boxes shall be cleaned of all dirt and debris before paving. Castings shall be inspected by the Engineer before asphalt base is placed.

If the street castings are adjusted after the pavement base course has been constructed, the resulting void around the casting shall be completely filled with compacted base course material prior to construction of the finished pavement. The use of concrete to fill the void around the casting will not be allowed. When catchbasin castings are adjusted, the Contractor shall fill the void between the casting and masonry below with cement mortar so as to insure a watertight joint.

10. Bituminous Hot-Mix Base Course

- a. Preparation--The Contractor shall fine grade all areas to be paved, blend the subgrade soils to minimum depth of 12-inches for uniformity across all lines of soil type, and compact the subgrade as required under Section 9, Sub-Base Preparation, of these Specifications prior to constructing Bituminous Base Course. Additional grading and compacting of the subgrade may be required to eliminate rutting, displacement or weak areas in subgrade materials when hauling over the subgrade during placement of the Bituminous Base Course. It shall be the Contractor's responsibility to provide a completely stabilized and compacted subgrade on which to place base course materials. Subgrade shall be graded to the proper cross-section and crown.
- b. Bituminous Base Course Materials--The Bituminous Base Course shall conform to the requirements of MDOT 2012 Standard Specifications, in accordance with Table 7.10-1 and Table 7.10-2 Composition of Bituminous Mixtures to be as per MDOT Standard Specifications, except that the aggregate shall be modified to reduce the amount (percentage) passing the No. 200 sieve from 3-12% to 3-9% and the minimum allowable percent of Bitumen content shall be not less than 4.9% and shall range upward to maximum of 6.0% based on the job mix formula. Mix design shall be based on requirements of the modified Marshall method described in Chapter III of the Asphalt Institute's Manual Series No. 2 (MS- 2) and the bitumen content as a percentage of total weight of the mix shall be in proportion to the amount of fines such as is required for 95% of optimum density as determined by the Marshall Method. The Contractor shall furnish an in-place Bituminous Base Course which fully meets the requirements of the modified Marshall Method.

When it is required that the final wearing course paving is not to be constructed until the following construction season, the Contractor shall provide a job mix formula with sufficient bitumen content to eliminate loss of aggregate "raveling" during the interim winter period and the Bituminous Base Course shall provide a smooth neat interim cohesive road surface free for cracking and weak areas.

At least 30 days prior to furnishing and placing Bituminous Base Course, the Contractor shall make available the source of aggregate supply for the project for testing. The project Bituminous Base Course shall be based on the job mix formula as required by the "Modified Marshall Method" and the Contractor shall be solely responsible to furnish and construct the Bituminous Base Course uniformly meeting the requirements of the job mix formula may be sufficient cause for removal and replacement of the material placed as may be determined by the Engineer. Removal and replacement shall be at the Contractor's expense.

- c. Construction of Base Course--The Bituminous Base Course shall be constructed in accordance with the plan cross-section. The base course shall be laid in not less than two layers nor exceeding three inches in depth for each layer. All equipment and construction procedures and methods shall be in accordance with the MDOT

2012 Standard Specifications. An asphalt emulsion bond coat shall be provided and applied between each course of base. The surface shall be properly swept and cleaned prior to applying bond coat material. Bond coat shall be applied at the rate of 0.15 gallon per square yard and shall be applied in a uniform film on the entire surface. Cost of bond coat shall be incidental to base course construction unless otherwise provided in the Bid Proposal.

The Bituminous Base Course shall be laid uniformly on the prepared subgrade at the rate specified on the Plans. Any weak areas in the first or subsequent courses of the Bituminous Base Course, indicated by cracking, rutting, raveling or failure due to trucking or other reasons shall be removed and replaced to acceptable condition prior to placing subsequent layers of the Base Course Material. Corrections or replacement of the subgrade material may be required if failure is due to inadequate subgrade stability. The Contractor shall be responsible for providing a completely stabilized, fully compacted Bituminous Base of the required cross-section, without defects and no payment shall be allowed for Bituminous Base Course removed and replaced because of cracking, rutting or failure to meet the requirements of the specifications, including 98% density of the "modified Marshall Mix Design," (job mix formula); the Engineer may require removal and replacement of base course materials which fail to meet these specifications, regardless of any other provisions or remedies within these Contract Documents.

Each course of the Bituminous Base Course shall be rolled and fully compacted at the proper temperature to achieve a density of at least 98% of maximum density as determined by the modified Marshall Test. The Contractor shall be responsible to provide the necessary rolling equipment of sufficient size and capacity to obtain the required results. The Engineer may require additional rolling equipment if adequate density is not obtained for the in-place material.

Suitable bituminous ramps shall be provided around all street castings when wearing course is delayed until the following year. Ramps shall be provided at no additional cost for placing and removal prior to construction of wearing course.

11. Alternate Bid for Aggregate Base

Where required on the Plans or in the Bid Proposal, the Contractor shall construct the aggregate base in accordance with the Alternate Cross- section and Specifications as detailed on the Plans.

The Contractor shall compact and fine grade all areas set forth on the Plans, compact the base as described in Section 9, Sub-Base Preparation, place and compact the specified aggregate base and construct thereon a wearing course of hot asphalt as described below and required on the Alternate Cross-Section and Specifications on the Plans.

After construction of curb and gutter, the street surface shall be graded to the specified cross-section and to a sufficient depth so that when the required thickness of aggregated base and the specified per square yard of bituminous pavement is placed, the surface shall be at the required elevation and cross-section. The material and workmanship for aggregate base shall be in accordance with MDOT 2012 Standard Specifications.

12. Bituminous Hot-Mix Wearing Course and Leveling Course

- a. Time of Placement--For contracts which include new bituminous base course or aggregate base course construction, placement of new Bituminous Hot-Mix Wearing Course will not be constructed until the construction season in the next calendar year following construction of the base course and other road or street improvements, unless specifically provided otherwise in the Special Conditions of these Specifications.
- b. Preparation--The Contractor shall fully prepare the previously constructed Bituminous Base Course, Aggregate Base Course, or Bituminous Leveling Course prior to constructing the new Bituminous Wearing Course. Preparation shall include sweeping, cleaning, patching, adjusting street castings as necessary, removing asphalt ramps around castings, plugging temporary drains, and any other work to bring the base course to acceptable condition as required in the Specifications for Base Course Construction. The base course and/or leveling course shall be thoroughly cleaned by sweeping, washing, and blowing as may be required by the Engineer to provide a completely clean surface free of all foreign material. Where the base course and/or leveling course material does not meet the requirements of the plan cross-section for proper crown, slope, or grade elevation, the Contractor shall be responsible to bring the cross-section to acceptable standards by adding additional new Bituminous Wearing Course material or other methods acceptable to the Engineer. All weak, or other areas of failure, indicated by cracking, scaling or serious loss of surface materials shall be repaired as required by the Engineer. All costs relating to preparation shall be the responsibility of the Contractor and incidental to Bituminous Base Course, Bituminous Leveling Course or Bituminous Wearing Course construction and no payment shall be allowed, therefore.
- c. Bituminous Hot-Mix Wearing Course and/or Bituminous Leveling Course Materials--Bituminous Wearing Course shall conform to the requirements of MDOT 2012 Standard Specifications. The specific project mix requirements shall be as specified on the Plans and in accordance with respective mix designation provided in Table 7.10-1 and 7.10-2, "Composition of Bituminous Mixtures", in the MDOT 2012 Standard Specifications, except as specifically modified herein or on the Plans. Minimum allowable Bitumen content shall not be less than 5.1% for any mix furnished and shall range upward in accordance with the job mix formula. The Bitumen content as a percentage of total weight of the mix shall be in proportion to the amount of fines. Mix design shall be based on the requirements of the modified Marshall method, described in Chapter III of the Asphalt Institute's Manual, Series No. 2 (MS-2).

At least 30 days prior to furnishing and placing Bituminous Wearing Course and/or Bituminous Leveling Course, the Contractor shall make available the source of aggregate supply for the project for testing. The project Bituminous Wearing Course and/or Bituminous Leveling Course shall be furnished and placed in accordance with the job mix formula as required by the Modified

Marshall Method, and the Contractor shall be solely responsible to provide a uniform pavement fully meeting the job mix requirements and all other requirements of the MDOT 2012 Standard Specifications. Failure to meet these requirements may be sufficient cause for removal and replacement of the material placed, as may be determined by the Engineer. Removal and replacement shall be at the Contractor's expense.

- d. Construction of Bituminous Wearing Course or Bituminous Leveling Course--
The Bituminous Wearing Course or Bituminous Leveling Course shall be constructed in accordance with the Plan cross-section and laid at the specified rate of application. Construction equipment, procedures and methods shall be in accordance with the MDOT 2012 Standard Specifications. An asphalt emulsion bond coat shall be provided and applied over the properly cleaned base course and between each course of the Bituminous Wearing Course where more than one course is required. Bond coat shall be applied at the rate of 0.15 gallons per square yard unless otherwise approved by the Engineer. Bond coat shall be uniformly applied over the entire surface to be paved. Cost of bond coat shall be incidental to bid for Bituminous Wearing Course and/or Bituminous Leveling Course.

Each course of the Bituminous Base Course shall be rolled and fully compacted at the proper temperature to achieve a density of at least 95% for maximum density as determined by the modified Marshall Test. The Engineer may require additional rolling equipment if adequate density is not obtained in the in-place material. Any defects in the final Bituminous Wearing Course shall be completely repaired and or removed and replaced as required by the Engineer.

13. Notice to Engineer Before Asphalt Placement

The Contractor shall give the Engineer twenty-four (24) hours' notice before beginning placement of asphalt.

14. Existing Gas, Electric and Telephone Utilities

Gas mains, services and other gas equipment and electric overhead lines, poles, underground cables and other electrical equipment, and telephone lines, overhead and underground, telephone poles and other telephone companies. The Contractor shall notify the various utility companies of the work involved and make all arrangements, financial and otherwise, with the said utility companies in matters pertaining to the work in connection with the said utilities. He shall save the Owner harmless from all claims by the owners of the respective utility companies.

15. Test Specimens

The Engineer will make concrete test cylinders and collect bituminous paving mixture samples for testing. The cost of tests will be borne by the Owner.

16. Maintaining Traffic

The Contractor shall provide reasonable facilities for maintaining local traffic to property along the project and for maintaining major or through traffic at street intersections or through the project when required by the Engineer. He shall provide for all barricades, signing and other required means for designating and maintaining traffic under safe conditions and for maintaining detours where permitted by the Engineer. The Contractor shall cooperate with the local police and the Engineer in providing and maintaining proper and safe equipment which may be required in the opinion of the police or the Engineer for properly maintaining traffic.

17. Topsoil Restoration

The Contractor shall furnish, place and grade a minimum of three inches of topsoil over all disturbed earth areas. Methods and materials for topsoil placement shall be in accordance with the MDOT 2012 Standard Specifications. Topsoil shall be uniformly applied over the graded subsoil surface. The Contractor shall place new topsoil surface over all earth areas between the new sidewalk and new curb and gutter to provide a completely new restored parkway. All areas behind the new sidewalk shall be graded and restored as required by the Engineer to blend new grades with existing lawn grades and to restore all disturbed areas.

Topsoil furnished by the Contractor shall be approved by the Engineer prior to placement. Topsoil shall be free of roots, stones and other debris and of a rich, black friable texture.

18. Fine Grading and Cleanup

Before final acceptance of the work, the Contractor shall remove all excess excavation and debris from the site. He shall neatly fill and fine grade all exposed construction areas. All sidewalks, pavements and driveways shall be swept clean. The Contractor shall also as nearly as practical, restore all lawns, trees and shrubbery to their original condition and to the satisfaction of the Engineer.

19. Removal of Existing Pavements-Rotomilling or Other Methods

Where required on the Plans or in the Bid Proposal, the Contractor shall remove existing asphalt or concrete pavements to the required thickness or depths by rotomilling or other methods acceptable to the Engineer. Rotomilling or other methods of removal shall be done in a neat and workmanlike manner to the lines and depths required by the Engineer. Saw cutting, removal by hand or other methods may be required in tight or restricted areas.

Street castings such as manhole covers, valve boxes, or catchbasins in streets which are to be planed, rotomilled or removed prior to placement of new asphalt surfaces, shall be removed and temporarily plated prior to rotomilling or removal of existing pavement. Street castings shall not be replaced until after base and leveling courses have been constructed and just prior to placement of final asphalt wearing course. Castings shall be adjusted to fit the exact finish grade and slope of new pavement and shall be thoroughly mortared in place.

All materials removed by rotomilling or other methods shall become the property of the Contractor for use or disposal. Payment for rotomilling or other methods of pavement removal shall be as provided in the Bid Proposal.

20. Cracking or Fracturing of Existing Concrete Pavements

Where required on the Plans or in the Bid Proposal, the Contractor shall provide equipment and labor of cracking existing concrete pavements.

After removal of existing asphalt, the concrete pavement shall be cracked prior to placement of new asphalt base course.

The equipment used for cracking shall be suitable for cracking the pavement without excessive shattering or disintegration of the pavement and without excessive shock or vibration damaging to buried utilities or to adjacent property or structures. The Contractor shall be responsible for proper selection and use of cracking equipment which will result in an approved pattern of cracking without excessiveness displacement of slabs or damage to property.

Following removal of the existing overlays, the existing concrete pavement shall be cracked by such equipment and by such methods as will transversely crack the concrete slabs in place at 24" (plus or minus 6") intervals for full depth and without displacing the cracked pieces. Following the cracking of the concrete pavement, it may be necessary to fill voids between pieces created by the cracking. If required by the Engineer, this shall be accomplished using 2NS fine aggregate and vibratory compactors to assure a firm setting of the cracked pieces.

The Contractor shall cooperate and assist the Engineer with inspection of the cracking methods. This may include but will not be limited to sweeping and removal of loose material and watering for crack detection and inspection. When required by the Engineer, the Contractor shall make such adjustments in methods and/or equipment which will produce crack widths and patterns which meet the approval of the Engineer.

After cracking is completed, the street surfaces shall be thoroughly cleaned by sweeping and compressed air prior to applying the required bond coat and asphalt paving. The Engineer may also require the use of suitable vibratory rolling equipment to firmly "seal" all slabs in the cracked surface.

Pavement for pavement cracking will be in accordance with the unit price bid in the Bid Proposal.

Measurement for Payment of Street Improvement Items

When set forth in the Bid Proposal, the following methods shall be used to establish payment for work completed and accepted under this contract. When the following items are part of the project and not set forth in the Bid Proposal, they shall be deemed included within other items of work.

MDOT Specified Aggregate(s)--Payment will be made at the unit price bid per square yard of MDOT specified Aggregate(s) furnished, placed and compacted times the actual number of square yards furnished.

Curb and Gutter --Payment will be made for actual number of lineal feet built at the unit price bid. The furnishing and placing of reinforcing bars when required on the plans is incidental to construction and no extra payment will be made, therefore.

Sidewalk--Payment will be for the units set forth in the Bid Proposal at the unit price bid for sidewalk constructed.

Driveways--Payment for single and double driveways will be at the unit price bid per square feet times the actual number of square feet placed.

Bituminous Base Course or Pavements--Will be paid for at the unit price bid per square yard or per ton times the actual number of units placed. All weigh tickets must be provided to the inspector on the work. The weigh tickets shall be used to verify the rate of application. No payment will be allowed for asphalt placed in excess of 6% of the specified rate of application.

When making payments to the Contractor for asphalt placement, the Owner shall reduce the contract unit price for insufficient asphalt content as liquidated damages and not as a penalty as may be provided in the specifications.

<u>Percentage by which asphalt content is below percentage by weight specified.</u>	<u>Amount by which payment for asphalt placement shall be reduced from the contract price.</u>
0.10% through 1.0%	1% of unit price per square yard for each 0.10% below specified asphalt content.
1.0% through 2.0%	2% of unit price per square yard for each 0.10% below specified asphalt content.
More than 2%	Remove and Replace Pavement

Sidewalk Ramps for Handicapped Persons--When bid separately in the proposal, sidewalk ramps shall be paid for at the unit price each. When no item is provided in the bid proposal, sidewalk ramps shall be considered incidental to sidewalk construction and the cost therefore shall be included in the unit price for sidewalk construction.

Structural Plate Arch--Payment will be made on a lump sum basis for the complete structural plate arch in place, including excavation, strip foundations including reinforcing steel, structural plate arch completely assembled, concrete thrust beams and

all other incidental items except granular backfill which shall be paid for separately.

Concrete Headwalls--Payment will be made per cubic yard of concrete placed including reinforcing steel, excavation, forming placing, finishing and all other incidental work for completed Head walls.

Rotomilling - Rotomilling removal or other methods of removal of existing pavements will be measured by the square yard of pavement removed for the full depth required to be removed. Pavement for rotomilling or other methods of removal shall be at the unit price bid per square yard times the actual number of square yards removed.

Pavement Cracking - Cracking of concrete pavement will be measured by the square yard of pavement satisfactorily cracked. Payment for cracking shall be at the unit price bid per square yard, in the proposal times the actual number of square yards cracked. Payment shall include all incidental costs for cracking, seating of cracked sections, cleaning and sweeping, and requirements for wetting and testing.

TURF ESTABLISHMENT

1.01 DESCRIPTION

Furnish and place topsoil and/or compost, fertilizer, seed, sod, mulch, turf mulch blankets, mulch anchor, net for mulch, water, and weed control. Construct according to state and federal guidelines including but not limited to The MDOT Erosion and Sedimentation Control Plan and the National Pollution Discharge Elimination System (NPDES).

Mulch Anchor. A glue type material sprayed over mulch to hold it in place. Tackifiers, mulch tackifier, adhesives, mulch adhesive, binder sand mulch binder are all terms that are sometimes used to refer to mulch anchor pay item materials.

Broadleaf Weed. Those weeds described by the Engineer that are to be the target weeds controlled by spraying. Examples of broadleaf weeds include, but are not limited to the following: dandelion, dock, clovers, bindweed, thistles, ragweed, lambs quarter and wild carrot.

Compost. A mature/stabilized, humus-like material derived from the aerobic decomposition of yard clippings, leaves and brush materials less than four inches in diameter.

Dormant Seeding. Seeding done in late November and December when plant growth has ended for the season. The seed is placed on unfrozen ground and mulched to lie dormant over winter and germinate the following spring.

Friable. Friable soil is easily crumbled or pulverized.

Friable Condition. A soil in a “friable condition” is a surface that is in a crumbled, pulverized, worked-up, loosened, or cultivated state, free of lumps and clods detrimental to seeding and sodding operations.

Humus. A brown or black material formed by the decomposition of vegetable or animal matter, the organic portion of soil essential to the fertility of the earth.

Hydroseeding. Spraying seed combined with water onto the prepared seed bed. Use a spray solution free of mulch.

Mulch. A material placed over seeding to improve the germination of seed by conserving moisture, moderating the soil temperature, and protecting the seed and soil from water and wind erosion.

Peat. Organic matter consisting of un-decomposed or slightly decomposed plant material accumulated under conditions of excessive moisture. If the organic remains are sufficiently fresh to identify plant form, it is considered peat; if decomposition has gone as far as to make recognition of the plant form impossible, it is muck.

Target Weed. Weeds that the Engineer has identified for removal, either by spraying, or other methods.

1.02 CONSTRUCTION

A. **Topsoiling.** Prepare the foundation, furnish, place, and spread humus bearing topsoil and/or compost. Use topsoil either from within the grading limits or from off-site commercial sources.

1. **Preparation of Earth Bed.** Seven to ten days before preparing earth bed, spray and kill all existing vegetation with Glyphosate (nonselective herbicide), including areas previously mulched or rye seeded for temporary erosion control. Bring the earth bed to the required grade and trim. Just before placing topsoil or compost, harrow all earth beds, including areas previously mulched or rye seeded for temporary erosion control. Harrow into a friable condition with a disk, a spring tooth drag, or a spike tooth drag a minimum of three inches deep. All soil impressions left by equipment used to complete this work must be horizontal across the face of the slope.

2. **Placing Topsoil.** Cover all areas to be seeded or sodded with topsoil and/or compost. However, topsoil placement is not required on slopes constructed of topsoil, muck or peat. Spread topsoil and/or compost on the prepared areas at least three inches deep. Pulverize all large clods and lumps. Rake out rocks more than one half inch in diameter, roots, litter and all foreign matter. Dispose of this material in a safe and legal manner. Incorporate all topsoil and/or compost placed on the conditioned earth bed into the upper two inches of the earth bed. Do not work topsoil and/or compost when wet.

3. **Surplus Excavated Topsoil or Salvaged Topsoil.** The Engineer will direct the stockpiling of surplus topsoil or salvaged topsoil within the right of way. Leave the stockpile with an aesthetically pleasing appearance.

B. **Chemical Fertilizer Nutrient.** Furnish and place fertilizer on the areas required. In areas to be sodded, uniformly apply granular fertilizer before sod is laid. Uniformly apply granular fertilizer on the prepared seed/sod bed and incorporate into the upper 1 to 2 inches of the topsoil and/or compost by light disking or harrowing. Apply granular fertilizer free from lumps. Constantly agitate fertilizer applied by the hydroseeding method. Do not disk or harrow after placing. Apply fertilizer mixed with seed within one hour after mixing.

1. **Class A.** Evenly apply 228 pounds of chemical fertilizer nutrient per acre of prepared seed bed.

2. **Class B.** Evenly apply 120 pounds of chemical fertilizer nutrient per acre of prepared seed bed.

3. **Class C.** Evenly apply 80 pounds of chemical fertilizer nutrient per acre of established turf.

C. **Seeding.** Prepare the seed bed, furnish and sow the specified mixture of seed. Sow seed after topsoil has been placed according to subsection A and approved by the Engineer. Do not broadcast or hydroseed during windy conditions or conditions that would prevent the proper placing of the seed. See Tables 1 and 2 for turf and specialty seed mixtures and rate of seeding.

1. Permanent Seeding.

a. **Sowing.** Sow the seed following or in conjunction with fertilizing while the seed bed is in a friable condition. Just before seeding, harrow the topsoil and/or compost 3 inches deep or more. Harrow with a disk, a spring tooth drag, a spike tooth drag, or other equipment designed to prepare the soil to a friable condition and meeting the approval of the Engineer. Harrow horizontally across the face of the slope. Areas where seed mixture Turf Loamy to Heavy (THM) is specified, grade the seed bed to within ± 1 inch of average slope as shown on the plans (Class A). Sow seed before applying mulch. Sow or resow the seed mixture, providing uniform coverage, at the rate specified in Tables 1 and 2. Sow with either mechanical drills, hydroseeders, or by broadcasting. Seed areas with 1:4 slopes or flatter with mechanical drills. Hydroseeding may be used on slopes steeper than 1:4. The Engineer will determine the effectiveness of the seeding equipment. Empty the hydroseeder tank within one hour of adding the seed and fertilizer. Dispose of seed that remains mixed with the water for longer than one hour. Broadcast in areas to be resown or in areas that are unaccessible to a drill or hydroseeder. The Engineer will visually inspect areas sown by broadcast or hydroseed for uniformity of application. Resow areas that do not have an average of two seeds per square inch. All costs associated with this reseeding will be borne by the Contractor.

b. **Setting the Seed.** Lightly compact or rake areas sown by hydroseed or broadcast methods to incorporate the seed into the uppermost 1/2 inch of the top soil surface. Immediately after setting the seed, mulch according to subsections 1.02.E and 1.02.F.

Table 1 General Roadside Seed Mix Selection Guide

Symbol for Seed Mixture	Soil Type	General Location	Seeding Rate	Salt Tolerance
TDS (Turf Dry Sandy)	Dry sandy to sand loam	Rural or urban	220 lb/acre	Low to medium
THV (Turf Heavy Soil)	Heavy	Rural	220 lb/acre	Medium to high
TUF (Turf Urban Freeway)	All types	Urban freeways, blvds., service roads, city streets	220 lb/acre	Low to high
TGM (Turf Medium to Heavy Soil)	Medium to heavy	All	220 lb/acre	Low
THM (Turf Loamy to Heavy)	Loamy to heavy	Residential and business turf	220 lb/acre	Low to medium

Table 2 Specialty Seed Mix Selection Guide

Symbol for Seed Mixture	Soil Type	General Location	Seeding Rate	Salt Tolerance
Mixture for Upland Areas				
ES (Environmental Seeding)	All	Upland Areas	110 lb/acre	—
Temporary Seeding Mixtures				
CR (Cereal Rye, less than 6 mos.)	All	All	70 lb/acre	—
TSM 6/24 (Temporary seeding, 6-24 mos.)	All	All	100 lb/acre	—
TSM 24+ (Temporary seeding, 24+ mos.)	All	All	200 lb/acre	—

2. **Temporary Seeding.** Place temporary seed only for erosion control or temporary soil stabilization. Do not temporarily seed slopes 1:3 or steeper after top-soiling; permanently seed these slopes. Secure the Engineer's approval for all temporary seeding. Sow temporary seed according to subsection 1.02. C.1. Before contract completion, replace temporary seeding by permanent seeding as called for on the plans or as directed by the Engineer.

3. **Dormant Seeding.** Dormant seeding will be permitted only in limited areas to complete a project. Dormant seed according to the requirements for permanent seeding. Secure the Engineer's written approval for all dormant seeding.

4. **Seasonal Limitations.**

a. **Permanent Seeding.** Seed only during the following periods.

Southern Lower Peninsula: South of the north boundary of Township 20 North; April 15 through October 10.

Northern Lower Peninsula: North of the north boundary of Township 20 North; May 1 through October 1.

Upper Peninsula: May 1 through September 20.

b. **Dormant Seeding.** Dormant seed only during the following periods:

Southern Lower Peninsula: South of the north boundary of Township 20 North; after November 15 but not on frozen ground.

Upper Peninsula and Northern Lower Peninsula: North of the north boundary of Township 20 North; after November 1, but not on frozen ground.

c. **Temporary Seeding.** Follow the same seasonal limitations as for permanent and dormant seeding.

5. **Inspection.** The Engineer will inspect the seeded turf to ensure that the end product is well established, weed free, in a growing and vigorous condition, and contains the species called for in the seeding mixture. If the Engineer requires weed control, complete this work according to Subsection 1.02.J. If hay mulch is used, the Owner will not pay for weed control.

D. **Sodding.** Prepare the topsoil surface, furnish and place the sod, and dispose of all surplus material. Grade areas to be sodded to Class A slopes according to subsection 1.02. C.1. Just before laying sod, harrow the topsoil a minimum of 3 inches deep with a disk, spring tooth drag, spike tooth drag or other equipment designed to condition the soil. Secure the Engineer's approval of harrowing equipment. Harrow horizontally across the face of the slope. Thoroughly water the earth bed before laying the sod and water the sod immediately after it is laid according to subsection 1.02.I. Sod which has been allowed to dry out at any time will be rejected. Lay sod within 24 hours after cutting and properly protect until placed. Do not handle sod with pitch forks nor dump from vehicles. Do not place frozen sod, nor place sod on frozen soil. Do not place sod in the months of June, July or August unless approved by the Engineer. Place sod

according to M Dot Standard Plan R-100 Series. Stagger the short ends of the sod strips and lay parallel to the flow of water on slopes and in ditches. Place strips with tight joints. Lay sod starting at the base of the slope and working upward. Turn edges of sodded areas into the ground and cover with a layer of earth or shoulder material. Thoroughly compact this material to allow the surface water to flow over the edge of the sod. Butt the edges of sod firmly against, and level with, paved surfaces. When the sod may be displaced during sodding operation, work from ladders or treaded planks. Firmly compact sod by tamping immediately after it is placed. Tamp to a smooth, even surface free from bumps and depressions. Where Class A slopes are specified, finish the surface to a lawn-like appearance. On slopes steeper than 1:3, peg the sod with wooden pegs. Space pegs not more than 2 feet apart in any direction and drive flush with the surface of the sod.

E. **Mulching.** Furnish, spread and anchor mulch materials. Place mulch on a given area within one day after seeding. Do not mulch during winds that prevent proper placing and anchoring of the mulch. Place mulch loose or open enough to allow some sunlight to penetrate and air to circulate, but thick enough to shade the ground, conserve soil moisture, and prevent or reduce water or wind erosion. Maintain the mulched areas and repair all areas damaged by erosion, traffic, fire or other causes before final or partial acceptance. Replace mulch that is displaced. All costs associated with this repair or replacement work will be borne by the Contractor.

Spread mulch over the surface to a uniform thickness at 2 tons per acre. However, where dormant seeding has been permitted, place the mulch at 3 tons per acre. When hay mulch is permitted, apply at 1.5 times the rate required for straw mulch. After seed germinates and turf is established, apply herbicide according to subsection 1.02.J to control weeds. All costs associated with herbicide application to hay mulched areas will be borne by the Contractor.

F. **Mulch Anchoring.** Select mulch anchoring materials (tackifier) from a reputable commercial supplier. Spray mulch anchoring immediately after mulch is placed. Do not spray when wind would prevent the proper placement of adhesive. Protect all traffic, signs, structures, and other objects from being marked or disfigured by the tackifier material. Immediately remove overspray. Apply tackifiers at the following minimum rates per acre:

1. **Latex-Base:** Mix 15 gallons of adhesive, or the manufacturers recommended rate whichever is greater, with a minimum of 250 pounds of recycled newsprint and 375 gallons of water.
2. **Recycled Newsprint:** Mix 750 pounds of recycled newsprint with 1500 gallons of water.
3. **Wood Fiber:** Mix 750 pounds of wood fiber with 1500 gallons of water.
4. **Guar gum:** Mix 50 pounds of dry adhesive and a minimum of 250 pounds of recycled newsprint with 1300 gallons of water.
5. **Other Tackifiers:** Mix 100 pounds of dry adhesive, or the manufacturer's recommended rate whichever is greater, and a minimum of 250 pounds of recycled newsprint with 1300 gallons of water.

G. **Mulching Netting.** Place netting over mulch and secure with net anchors, staples, or pins. Spread the net over the mulch so that a worker can walk between adjacent widths of net. Pull the edges of adjacent widths of net together and hold in place with net anchors. Space net anchors not more than 2.5 feet apart along the edges, joints, and centerline of the net according to the manufacturer's recommendation. Do not place the net in direct contact with the ground. Butt the ends of each width of net together and hold in place by net anchors at each corner and at the center of the net. Do not permit traffic over the net after it is placed, except to repair it. Replace torn or damaged net with undamaged material.

H. **Mulch Blankets.** Furnish, install and anchor blankets. Select mulch blankets from the Qualified Product List. Place mulch blankets within one day after seeding. Overlap blanket side edges two inches. Shingle lap blanket ends 6 inches. Place staples or pegs along all joint edges and along blanket centerlines at a maximum spacing of two feet. However, in waterways shingle lap blankets with an overlap of 12 inches on the downslope edge. Place blankets on backslopes at right angles to the roadbed. On foreslopes, lay the first strip adjacent to the road parallel to the road, with the remainder of the strips placed either parallel or at right angles to the road. When blankets are installed from the top of the slope, do not allow them to free fall down the slope. Use net anchors (pins or staples) according to manufacturer's instructions. Place and anchor blankets according to the manufacturer's directions if those requirements are greater than these minimum requirements.

1. **High Velocity Blankets.** Use high velocity blankets on slopes 1:2 or steeper and on ditch bottoms (12 inches up the slope). High velocity blankets may be substituted for mulch blankets at no increase of cost.

2. **Mulch Blankets.** Use Mulch blankets on slopes flatter than 1:2, next to shoulders and behind curbs. Place mulch blankets with the netting on top and mulch fibers in contact with the soil. These blankets may only be used on ditch bottoms with slopes up to 1.5 percent.

I. **Water.** Furnish and apply water at the following rates. Use a minimum of 27 gallons of water to establish each square yard of sod. Thoroughly water the earth bed with a minimum of 3.5 gallons per square yard before laying the sod. Within eight hours after the sod has been placed, spray 6 gallons of water per square yard; apply 3.5 gallons per square yard five additional times at three to four day intervals. The Engineer may require additional applications based on the season and weather conditions. Water seeded areas, at 3.5 gallons per square yard when required. Continue watering regularly so that seed/seedlings do not dry out.

J. **Weed Control.** Weed control will be as directed by the Engineer. Have a commercial herbicide applicator, licensed in the State of Michigan and certified by the Michigan Department of Agriculture in the appropriate category, apply herbicides. Use application procedures and materials according to federal, state and local regulations. Spray target weeds in the newly seeded turf when the new turfgrass is sufficiently established to withstand a herbicide application. Furnish and apply herbicide(s) when directed by the Engineer. Select the herbicide(s) and the rate at which it will be used. Secure the Engineer's approval for the work and the herbicide(s) before application of the material.

Before spraying, the Engineer will inspect and approve the spraying equipment. Show that the equipment and operators can apply an even and controlled application within the specified target area. Use equipment meeting all federal, state and local safety requirements. Control target weeds within 14-21 days after spraying. Apply additional weed control if the first application was not successful. Preserve and protect all property next to the roadway from injury. Repair all damages arising from any act or omission in the performance of the work. All costs associated with this additional application or repair will be borne by the Contractor.

1.03 MEASUREMENT AND PAYMENT -Turf Establishment - Lump Sum

Payment includes topsoil, compost, seeding (or sodding as noted on plans), mulching, mulch anchoring, mulching netting, or mulch blankets (as noted on plans), watering, fertilizer, and weed control. Contractor shall carefully review plans and specifications and prepare his bid accordingly.

SECTION 2 - LANDSCAPE MOWING

2.01 Description. Mow, pick up litter and dispose of litter. Comply with all state regulations and local mowing ordinances. It is the intent to require the contractor to mow all restored areas one (1) time.

2.02 Construction.

A. **Equipment.** Use equipment suitable and adequate for the mowing operation. Do not create a hazard, hindrance or delay to the public nor damage to the roadside. Furnish equipment in good repair and maintain to produce a neat, clean and sharp cut to the grass at all times. Do not use equipment that pulls or rips grass or otherwise damages the turf. Use equipment that can cut to 3 inches above the ground. Equip mowers with guards to prevent debris from being thrown from under the cutter. The owner/engineer will not be responsible for damage to the Contractor's equipment due to obstacles encountered during the work. Mowing equipment will be power or hand equipment necessary to satisfactorily complete the work and similar nature as to the equipment that will be used by the owner during the course of regular maintenance.

B. **Construction.** All restored areas are to be mowed. Pick up, remove, and dispose of litter each day before cutting each area. Hand trim, tight to all walls, fences, curbs, poles or other fixed objects within the mowing areas. Mow areas to a height of 3 inches. Cut all hand trimming at walls and curbs flush to adjacent concrete or sidewalk.

2.03 Measurement and Payment.

Contract Item (Pay Item) Pay Unit

Mowing LSUM

Payment includes all work required to complete mowing including trimming. Litter and trash pickup and disposal are included in this pay item.

SECTION 3: MATERIALS

Water

3.01. General Requirements. Water turf and landscape plantings with potable or non-potable water from a source approved by the Engineer. Water must be free from any impurities or substances which might injure the plant.

Topsoil/Compost/Peat Moss

3.02 Topsoil. Topsoil must be visually inspected for organic contamination and cleanliness at the source by the Engineer prior to transport to the project site. Salvaged topsoil must be inspected and approved by the Engineer. Topsoil must not be contaminated and may not be a mixture of natural underlying soils, subbase materials, or other materials. It must consist of natural loam, sandy loam, silty loam or clay loam humus-bearing soils adapted to the sustenance of plant life. Topsoil must be neither excessively acidic nor excessively alkaline. It must be of mineral origin, exclusive of any peat or muck.

3.03 Compost. Furnish compost from a suitable commercial source. Compost must be a mature/stabilized, humus-like material derived from the aerobic decomposition of yard clippings or other compostable materials as designated in Part 115 of Act 451 of 1995 as amended and must be in compliance with all federal and state laws. The compost must have a dark brown or black color, be capable of supporting plant growth without ongoing addition of fertilizers or other soil amendments and must not have an objectionable odor. The compost must be free of plastic, glass, metal and other physical contaminants, as well as viable weed seeds and other plant parts capable of reproducing (except airborne weed species). The compost must be visually inspected and approved at the composting site by the Engineer for physical contaminants. The compost moisture content must be such that no visible free water or dust is produced when handling it.

3.04. Peat Moss. Peat moss must consist of finely shredded sphagnum or fibrous peat moss of an approved commercial grade, free from woody substance.

3.05. Fertilizers

3.05.01 Fertilizers. Fertilizers intended for use in connection with landscape planting, landscape plant watering, seeding and sodding must be standard, commercial, packaged or bulk products in granular or liquid form. Each container of packaged fertilizer must be plainly marked by the manufacturer and must include the analysis of the contents showing minimum percentages of total nitrogen, available phosphoric acid and soluble potash. When fertilizer is furnished in bulk, each shipment must be accompanied by an invoice indicating the minimum percentages of total nitrogen, available phosphoric acid and soluble potash in the contents.

A. Landscape Fertilizers.

- 1. Planting Fertilizers.** The fertilizer for mixing with peat moss and topsoil must be a ready-mixed granular material containing equal amounts by weight of phosphorus and potassium. Each cubic yard of prepared soil must contain sufficient chemical fertilizer to

provide one pound each of available phosphorus and soluble potassium (i.e. 5 pounds of 0-20-20, 10 pounds of 0-10-10, etc.).

2. **Watering Fertilizers.** The fertilizer to be applied during the watering of landscape plants must be a water soluble, nitrogen-enriched solution containing available nitrogen at the rate of 8.3 pounds per 1000 gallons of water (i.e. 42 pounds of 20-0-0, 18 pounds of 45-0-0, etc., fertilizer per 1000 gallons of water).

B. **Seeding and Sodding Fertilizers.** All fertilizers in each class must contain a water insoluble and water-soluble component.

1. **Class A.** Chemical nutrient for Class A fertilizer must be in the following proportions:

a. **Water Insoluble Fertilizer.** Apply 33 pounds of actual water insoluble nitrogen per acre (i.e. 131 pounds of Ureaform or 118 of IBDU, etc.). The water insoluble nitrogen must be from ureaformaldehydes and/or coarse grade isobutylidene diurea.

b. **Water Soluble Fertilizer.** Apply 65 pounds of actual nitrogen, phosphorous and potassium nutrient per acre (i.e. 340 pounds of 19-19-19, 540 pounds of 12-12-12, etc.). Must contain a 1:1:1 ratio of nitrogen, phosphorous and potassium. Components of the fertilizer are to include urea, diammonium phosphate and potassium chloride.

2. **Class B.** Chemical nutrient for Class B fertilizer must be in the following proportions:

a. **Water Insoluble Fertilizer.** Apply 32 pounds of actual water insoluble nitrogen per acre (i.e. 128 pounds of ureaform, 115 pounds of IBDU, etc.). The water insoluble nitrogen must be from ureaformaldehydes and/or coarse grade isobutylidene diurea.

b. **Water Soluble Fertilizer.** The rate of nitrogen must be 48 pounds of actual nutrient per acre and 40 pounds of actual potassium per acre (i.e. 104 pounds of 46-0-0 and 67 pounds of 0-0- 60, etc.). Components of the fertilizer are to include urea and potassium chloride.

3. **Class C.** Chemical nutrient for Class C fertilizer must be in the following proportions:

a. **Water Insoluble Fertilizer.** Apply 32 pounds of actual water insoluble nitrogen per acre (i.e.128 pounds Ureaform or 115 pounds IBDU, etc.). The water insoluble nitrogen must be from ureaformaldehydes and/or coarse grade isobutylidene diurea.

b. **Water Soluble Fertilizer.** The rate of nitrogen must be 48 pounds of actual nutrient per acre (i.e.104 pounds of 46-0-0, etc.). Components of the fertilizer are to include urea.

3.06. Seed/Sod.

3.06.01. Seed. Furnish the specified seed and mixture composed of certified seed of the purity, germination, and proportions, by weight, listed in Table 6-1. Select seed for each species from a reputable commercial supplier. Furnish seed in durable bags, each marked by the supplier of the blended mix with a tag giving name, lot number, net weight of contents, purity and germination. Seed testing may be conducted according to the Rules for Testing Seeds specified in the Proceedings of the Association of Official Seed Analysts. Deficiencies below the percentage specified for purity and germination will be evaluated for acceptability by the Engineer.

3.06.02 Sod. Sod must consist of a densely rooted blend of at least two bluegrass varieties with 15 percent to 30 percent creeping red fescue content, reasonably free from weeds and grown on soil that is the same as or similar to the topsoil at the project site. Sod must be approved in the sod field by the Engineer before it is harvested. Efforts must be made to select a sod which will adapt well to the salvaged or furnished topsoil at the construction site and with consideration of the future maintenance needs. Before cutting the sod, the grass must be mowed to a maximum height of 3 to 4 inches above the surface of the ground.

The sod must be cut at least 3.4-inch-thick to retain the dense root system of the grass and to allow handling without undue tearing or breaking. When sod is cut in strips it must be cut in small uniform units approximately 1.5 by 6 feet, or in such width or length that the sod can be handled without undue tearing or breaking. Sod may be cut, transported and laid in large rolls with machinery designed for that purpose.

A. **Pegs for Sodding.** Pegs must be made of sound wood, at least 10 inches long, with a cross-sectional area of no less than 0.75 square inches. In sandy or other similar soils, longer pegs may be required.

3.07. Mulch

3.07.01 Mulching Materials for Nursery Stock

A. **Shredded Bark.** Shredded bark must consist of tree bark which has been stripped and shredded from saw logs by means of a de-barking machine. The material must readily pass through a conventional mulch blower. Wood chips will not be allowed.

3.07.02 Mulch for Seed

A. **Loose Mulch.** Mulching material must consist of any straw or marsh hay in an air-dry condition. Hay in an air-dried condition will be permitted only when straw mulch or marsh hay is unavailable. Mulch materials must be clean, undamaged, and rot free. It must be substantially free of weed seed and other objectionable foreign matter.

B. **Turf Mulch Blankets.** Select mulch blankets from a reputable commercial supplier.

1. **High Velocity Mulch Blankets.** The blankets must have net covering on two sides. The net for the blanket must meet subsection

3.7.03 The net must provide the necessary reinforcement for protecting the blanket during shipping, handling, and installation.

A. **High Velocity Excelsior Mulch Blankets.** Furnish high velocity excelsior mulch blankets made from a uniform layer of interlocking excelsior fibers cut from sound, green timber. Roll weight when manufactured must average 12 ounces per square yard, +/- 10 percent. Weight of each roll at the time of manufacture and the name of manufacturer must be written or stenciled on the roll wrapper, or on an attached tag. Average weight of an entire shipment must be approximately 12 ounces per square yard. The blankets must be shipped in the form of a tightly compressed roll.

B. **High Velocity Straw Mulch Blankets.** Furnish high velocity straw mulch blankets made of a uniform layer of straw. The straw must be clean wheat straw free of weeds and weed seed. The straw and net covering must be securely stitched together to create a uniform mat. The blankets must weigh (dry) 8 ounces per square yard, +/- 10 percent. Weight of each roll and name of manufacturer must be written or stenciled on the roll wrapper or on an attached tag. Blankets must be shipped in the form of a tightly compressed roll.

C. **Mulch Blankets.**

1. **Excelsior Mulch Blankets.** Meet subsection 917.15.B.1.a. except that the weight may be from 8 to 12 ounces per square yard and the netting must be on one side.

2. **Straw Mulch Blankets.** Meet subsection 917.15.B.1.b except that the netting must be on one side.

D. **Mulch Anchoring.** Select mulch anchoring material from the Qualified Products List.

1. **Latex-Base.** Composition, by weight, of the latex emulsion polymer must be 48 percent styrene, 50 percent butadiene, and 2 percent additive; 42.0 to 46.0 percent solids; and a pH, as shipped, of 8.5 to 10.0. The emulsion must not be allowed to freeze or to be exposed to sunlight for a prolonged period of time.

2. **Recycled Newsprint.** Recycled newsprint mulch must consist of specifically prepared, biodegradable, shredded paper particles, consisting of recycled newsprint fibers. The recycled newsprint must contain a wetting agent, defoaming agent, and nontoxic dyestuff that will impart a bright green or blue color. The dyestuff must adhere tightly to the fiber minimizing leaching of the color after application. Recycled newsprint fiber must conform to the following minimum requirements.

Moisture content (total weight)- 12% max, shredded high-grade newsprint (oven dry) 96% min, Tackifier (by weight)- 1.5 % to 3%, Water holding capacity (water per 3.5 ounces of fiber)- 32 ounces min.

3. **Wood Fiber.** Use specially prepared, biodegradable, air-dried virgin wood fibers manufactured from 100 percent whole wood chips. The wood fiber must be manufactured with a tackifier. Recycled materials will not be allowed. The fibers must be dyed with a green or blue biodegradable dye to aid in visual metering during construction. The

process and materials must not contain growth or germination inhibiting materials. The wood fiber must conform to the following specifications:

Moisture content (total weight) 12% max, Organic wood fiber (oven dry) 95% min
Tackifier by weight 3% to 5%, Water holding capacity 35 ounces min (water per 3.5 ounces of fiber).

4. **Guar Gum.** Guar gum tackifiers must consist of a minimum of 95 percent guar gum by weight, the remaining must be dispersing and crosslinking additives.

5. **Other Tackifiers.** Other tackifiers may include water soluble natural vegetable gums or guar gums blended with gelling and hardening agents or a water-soluble blend of hydrophilic polymers, viscosifiers, sticking aids, and other gums.

E. **Mulch Netting.**

1. **Netting.** Use net with a mesh size not larger than 11.2 by 2 inches nor smaller than 1.2 by 1.2 inch. The netting must be fabricated from a plastic that has been formulated from or treated with a chemical which will promote the breakdown of the net within the first growing season after placement. The netting must have sufficient strength to hold the mulch in place and still deteriorate rapidly upon exposure to sunlight. Products which have been found to be lacking in strength and deterioration requirements on other projects will not be permitted on subsequent projects.

2. **Net Anchors.** Use net anchors of the material and design specified in the contract documents, or as approved by the Engineer. Do not use steel wire staples or pins to anchor mulch blankets or netting.

3.08 Weed Control

3.08.01: Weed Control. All herbicides selected for use by the Contractor must be registered for use on highway right-of-way by the Michigan Department of Agriculture and the United States Environmental Protection Agency. Do not use restricted use herbicides.

Table 1 - Section 8 - Seed Mixtures

Species	Purity, min percent	Germination, percent	Seed Mixture								Rate, (a) lbs/acre
			Mixture Proportions, percent by weight								
			TDS	THV	TUF	TGM	THM	CR	TSM 6-24	TSM 24+	ES
Kentucky Blue Grass	98	85	5	15	10	10	30				
Perennial Ryegrass	96	85	25	30	20	20	20		50	50	11
Hard Fescue	97	85	25		20	30					
Creeping Red Fescue	97	85	45	45	40	40	50				
Fults Salt Grass	98	85		10	10						
Cereal Rye	85	85						100			
Spring Oats	85	85							50	50	
Timothy											24
Little Blue Stem											3
Switchgrass											4
Indiangrass											3
Big Blue Stem											9

a. ES seed mixture application rate is shown in pounds of pure live seed per acre.

PRE-CONSTRUCTION VIDEO SURVEY

General

The Contractor shall furnish to the Owner an audio-visual tape record for the construction site for the purpose of establishing, for the record, conditions prior to construction. The audio-visual taping shall be of a professional quality that will clearly log an accurate visual description of existing conditions. The tape shall be in color and be made in CD format.

The audio-visual taping shall clearly show the date and time of taping. The audio-visual taping shall be within the two (2) week period prior to the Pre-construction meeting and under the supervision of the Engineer.

Any portion of the CD not acceptable for the determination of the above must be re-filmed.

Said CD shall be furnished prior to the preconstruction meeting and/or prior to placement of materials or equipment in the construction area.

The video coverage must include all existing cross streets, building addresses, driveways, sidewalks, retaining walls, building foundations, curbs, ditches, shrubbery or other structures located on the construction site. Where construction may necessitate a local detour of traffic, additional planning of the full highway right-of-way will be required. It will not be necessary to cover side street detours, only areas within the full highway right-of-way of the street along which the construction is being done. All access routes and temporary easement areas shall be covered.

Both sides of the entire construction site must be recorded with the rate of speed in the general direction of travel not to exceed 48 feet per minute. Panning areas rates and zoom-in zoom-out rates shall be controlled sufficiently so that playback will produce clarity of the object viewed, and locations must be identified by audio and video means at intervals of not more than 100 lineal feet.

The video must be recorded during a time of good visibility. Video survey should not be made during periods of precipitation, snow, leaves, or other natural debris.

To insure proper perspective, the distance from the ground to the camera lens shall not be less than twelve (12) feet, and the Owner shall have the authority to designate what areas may be omitted or added for audio-visual coverage.

The recording must be made on a continuous running CD on which sound and video information can be recorded.

The engineering stationing numbers must be accurate and correspond to the project stationing and must include the standard engineering symbols (for example, 14+84). This transparent information must appear in the lower half of the viewing screen. If there is no engineering stationing, each street shall be stationed individually starting at 0+00.

Below the engineering stationing, periodic transparent alpha/numeric information shall appear. This information shall consist of the name of the project, name of area covered, direction of travel, viewing sides, etc.

An index printout shall accompany each CD detailing the contents recorded on that particular CD. The index printout shall include either a footage code or a time code to assist locating various items of importance. Each CD and index printout shall include, but not be limited to, the project name, contract number, date of photography, contractor's name, CD number and page number.

For each of playback, the speed and electronics of the CD shall be equal to that which is standard to the electronic industry.

Payment shall be as bid in the Proposal according to the number of units built and accepted by the Owner.