

---

The City of Traverse City

ENGINEERING DEPARTMENT

GOVERNMENTAL CENTER  
400 Boardman Avenue  
Traverse City MI 49684



---

March 9, 2017

Bidder:

The City of Traverse City will receive sealed bids at the City Engineering Dept., Second floor, Governmental Center, 400 Boardman Avenue, Traverse City, Michigan, 49684, until **Thursday March 23, 2017, at 10:30 a.m.** for the following:

**2017 BRYAN CROUGH MEMORIAL PROJECT**  
(Plans & Specifications attached)

If the specifications are obtained from the City's website at [http://www.traversecitymi.gov/bids\\_and\\_rfps.asp](http://www.traversecitymi.gov/bids_and_rfps.asp) it is the sole responsibility of the Bidder to check the website for updates and addendums prior to the bid being submitted. You may also register on the website to receive notifications when requests for proposals or bids, updates and addendums are posted.

The City of Traverse City reserves the right to accept or reject any or all bids, waive irregularities, and to accept the bids either on an entire or individual basis that is in the best interest of the City.

The City accepts no responsibility for any expense incurred by the Bidder in the preparation and presentation of a bid. Such expenses shall be borne exclusively by the Bidder.

Only the successful Bidder will be notified. If you so desire, you may call for results.

You must indicate on the outside of the sealed envelope that the bid is for the **"2017 Bryan Crough Memorial Project"**

You must submit **TWO (2) bids** to the City Engineer's Office prior to the above-indicated time and date or the bid will not be accepted. Telefaxed or E-Mail bids will not be accepted.

Please note that if you have previously submitted an informal quote, you will still need to submit a sealed bid prior to the date and time specified above in order to be considered. Please ensure that all requirements listed in the specifications are met.

If you have any questions, please contact **Timothy J. Lodge, P.E., City Engineer**, at **(231) 922-4455**, before the bid is submitted.

PLEASE SUBMIT BID TO: Timothy J. Lodge, P.E., City Engineer  
Engineering Department, Governmental Center  
Second Floor, 400 Boardman Avenue  
Traverse City, MI 49684

### **INSTRUCTIONS TO BIDDERS**

1. All bids must be submitted to Timothy J. Lodge, City Engineer, City of Traverse City, Governmental Center, Second Floor, 400 Boardman Avenue, Traverse City, Michigan, 49684, **no later than 10:30 a.m. on Thursday March 23, 2017.**
2. All bids must be submitted in a sealed envelope and clearly marked **“2017 Bryan Crough Memorial Project” TELEFAXED AND E-MAIL BIDS ARE NOT ACCEPTABLE.**
3. The bid form(s) must be completed and signed by an authorized representative of the Bidder.
4. The City reserves the right to accept or reject any or all proposals, waive irregularities, and to accept the bid which in its opinion is in the best interests of the City.
5. All bids must remain firm for a period of thirty (30) days following the City's receipt of the bid.
6. Payment shall be paid within 30 days of satisfactory completion of project. It is the Vendor's responsibility to submit an invoice to the City of Traverse City.
7. The City's standard practice is to run checks for the payment of bills received, on the 10<sup>th</sup> and 25<sup>th</sup> day of each month. In order to receive payment on the 10<sup>th</sup> or 25<sup>th</sup> of the month, the Vendor shall submit an invoice for all work completed up to the fifth or twentieth day of the month to the City of Traverse City, Engineering Dept., 400 Boardman Ave., Traverse City, Michigan, 49684. This normally allows enough time for the City to review and approve the Vendor's invoice and process it for payment. Failure of the Vendor to properly submit invoices by the fifth or twentieth day of the month may be cause for the City to postpone payment of the invoice until the next scheduled run of checks.

The City may withhold any portion of payment as necessary from loss on account of:

- Defective work not remedied, or
- Failure of Vendor to make payments properly to subcontractors for material or labor, or
- Damage to another Vendor, or
- Damage to City Property

8. The City reserves the right to delete portions of the work without reducing the unit cost.
9. Standards. All work shall be done in accordance with the City of Traverse City Specifications and/or the MDOT 2012 Standard Specifications for Construction unless otherwise indicated.
10. Completion. Work on the Bryan Crough Memorial Project is to be coordinated with the Artist completing the sculpture under a separate contract. All work for the Bryan Crough Memorial Project shall be completed by June 9<sup>th</sup>.
11. Experience. Bidders shall be experienced in this type of work and evidence of bidder's qualifications may be requested.
12. Insurance: The Vendor agrees not to change and agrees to maintain the following insurance throughout the period of performance of this Agreement. The Vendor will upon execution of this Agreement provide a certificate of insurance to the City Clerk. The policy shall contain endorsements stating that at least a 10-day notice will be given to the City prior to termination or any change in the policy; and in the case where Vendor is required to name the City as additional insured, and shall provide an endorsement stating that the City has been named as an additional insured onto such policy for all claims arising out of the Vendor's work. Should any required insurance be cancelled, materially reduced or expired, all activities under this Agreement shall immediately cease until substitute insurance in compliance with all requirements hereof has been procured and evidence thereof presented to the City.
  - A. Commercial General Liability. The Vendor shall acquire and maintain commercial general liability insurance coverage in the amount of \$1,000,000 per occurrence with the City being named as additional insured for all claims arising out of the Vendor's work, including completed operations coverage (if required in the Request for Proposals/Bids).
  - B. Workers Compensation. The parties shall maintain suitable workers compensation insurance pursuant to Michigan law and the Vendor shall provide a certificate of insurance or copy of state approval for self insurance to the City Clerk upon execution of this Agreement.
13. Traffic Control. Traffic shall be maintained during the Vendor's operations in accordance with the current Michigan Manual of Uniform Traffic Control Devices.

**Bidder - Please complete and return**

**BID SUMMARY**

**TITLE: 2017 Bryan Crough Memorial Project**

**DUE DATE: Thursday, March 23, 2017 AT 10:30 AM**

Having carefully examined the attached specifications and any other applicable information, the undersigned proposes to furnish all items necessary for and reasonably incidental to the proper completion of this bid. Bidder submits this bid and agrees to meet or exceed all requirements and specifications unless otherwise indicated in writing and attached hereto.

Bidder certifies that as of the date of this bid the Company or he/she is not in arrears to the City of Traverse City for debt or contract and is in no way a defaulter as provided in Section 152, Chapter XVI of the Charter of the City of Traverse City.

Bidder understands and agrees, if selected as the successful Bidder, to accept a purchase/service order and to provide proof of the required insurance.

The Bidder shall comply with all applicable federal, state, local and building codes, laws, rules and regulations and obtain any required permits for this work.

The Bidder certifies that it is in compliance with the City's Nondiscrimination Policy as set forth in Administrative Order No. 47 and Chapter 605 of the City's Codified Ordinances.

The Bidder certifies that none of the following circumstances have occurred with respect to the Bidder, an officer of the Bidder, or an owner of a 25% or more share in the Bidder's business, within 3 years prior to the bid:

- (a) conviction of a criminal offense incident to the application for or performance of a contract;
- (b) conviction of embezzlement, theft, forgery, bribery, falsification or destruction of records, receiving stolen property, or any other offense which currently, seriously and directly reflects on the Bidder's business integrity;
- (c) conviction under state or federal antitrust statutes;
- (d) attempting to influence a public employee to breach ethical conduct standards; or
- (e) conviction of a criminal offense or other violation of other state, local, or federal law, as determined by a court of competent jurisdiction or an administrative proceeding, which in the opinion of the City indicates that the bidder is unable to

perform responsibility or which reflects a lack of integrity that could negatively impact or reflect upon the City of Traverse City, including but not limited to, any of the following offenses or violations of:

- i. The Natural Resources and Environmental Protection Act.
  - ii. A persistent and knowing violation of the Michigan Consumer Protection Act.
  - iii. Willful or persistent violations of the Michigan Occupational Health and Safety Act.
  - iv. A violation of federal, local, or state civil rights, equal rights, or non-discrimination laws, rules, or regulations.
  - v. Repeated or flagrant violations of laws related to the payment of wages and fringe benefits.
- (f) the loss of a license or the right to do business or practice a profession, the loss or suspension of which indicates dishonesty, a lack of integrity, or a failure or refusal to perform in accordance with the ethical standards of the business or profession in question.

Bidder understands that the City reserves the right to accept any or all bids in whole or part and to waive irregularities in any bid in the best interest of the City. The bid will be evaluated and awarded on the basis of the best value to the City. The criteria used by the City may include, but will not be limited to: ability, qualifications, timeframe, experience, price, type and amount of equipment, accessories, options, insurance, permits, licenses, other pertinent factors and overall capability to meet the needs of the City. The City is sales tax exempt – Government.

Having read and clearly understood the instructions to bidders, plans and specifications for the Bryan Crough Memorial Project, the quantities estimated and being thoroughly familiar with the work to be performed, I/we hereby submit the following bid as Exhibit A (attached).

## EXHIBIT A

**BIDDER: PLEASE COMPLETE AND RETURN**

**DUE: 10:30 a.m., Thursday  
March 23, 2017**

### **BID**

#### **2017 Bryan Crough Memorial Project**

The undersigned bidder, having carefully examined the local conditions affecting the cost of the work and with the specifications, contract documents and any other applicable information, hereby proposes to perform everything required to be performed and to provide and furnish all labor, materials, necessary tools, equipment and all utility and transportation services necessary to perform and complete this project in a workmanlike manner in accordance with the plans and the work description.

Bidder submits this bid and agrees to meet or exceed all of the City of Traverse City's requirements and specifications unless otherwise indicated in writing and attached hereto.

Bidder certifies that as of the date of this bid, Bidder's company or Bidder is not in arrear to the City of Traverse City for debt or contract and is in no way a defaulter as provided in Section 152, Chapter XVI of the Charter of the City of Traverse City.

Bidder understands and agrees, if selected as successful bidder, to enter with the City into the contract included with the specifications.

Bidder understands that the City reserves the right to accept any or all bids in whole or in part and to waive irregularities in any bid in the best interest of the City of Traverse City. The bids will be evaluated and awarded on the basis of the best value to the City. Criteria used will include, but not be limited to, price, accessories, options and overall capability meeting the needs of the City.

Bidder agrees that the bid may not be withdrawn for a period of sixty-three (63) days from the actual date of the opening of the bid.

The prices shown in this bid reflect an anticipated working time of **45** calendar days starting from the dates specified in the "Notice to Proceed". The Bidder shall be responsible for liquidated damages of Four Hundred Dollars (\$400) per calendar day for each day after the **45** **Calendar day** working time limit as specified in the Notice to Proceed. It is the intent of the City to have this project completed by **June 9, 2017**.

**2017 Bryan Crough Memorial Project**

| <b>Item No</b> | <b>Est Qty</b> | <b>Unit</b> | <b>Description of Items</b>                                    | <b>Unit Price</b> | <b>Total Price</b> |
|----------------|----------------|-------------|--|-------------------|--------------------|
| 1              | 1              | LSUM        | MOBILIZATION / TRAFFIC CONTROL / SITE PREPARATION              |                   |                    |
| 2              | 15             | SYD         | SIDEWALK, REM  |                   |                    |
| 3              | 113            | FT          | CURB AND GUTTER, CONC, DET E2, MODIFIED                        |                   |                    |
| 4              | 1323           | SFT         | CONC., 6 INCH, NON-REINFORCED, SIDEWALK / ADA RAMPS, DRIVEWAYS |                   |                    |
| 5              | 1              | LSUM        | SCULPTURE FOOTING AND SLAB ON GRADE                            |                   |                    |
| 6              | 773            | SFT         | BRICK PAVERS, NONVEHICULAR, SALVAGED                           |                   |                    |
| 7              | 20             | CYD         | SUBGRADE UNDERCUTTING, TYPE CL II                              |                   |                    |
| 8              | 13             | EA          | GREY DOGWOOD (CORNUS RACEMOSA)                                 |                   |                    |
| 9              | 120            | EA          | DWARF BUSH HONEYSUCKLE (DIERVILLA LONICERA)                    |                   |                    |
| 10             | 2              | EA          | EASTERN WHITE PINE, 10 FT (PINUS STROBUS)                      |                   |                    |
| 11             | 2              | EA          | EASTERN WHITE PINE, 8 FT (PINUS STROBUS)                       |                   |                    |
| 12             | 1              | EA          | EASTERN WHITE PINE, 6 FT (PINUS STROBUS)                       |                   |                    |
| 13             | 11             | EA          | MOHICAN VIBURNUM (VIBURNUM LANTANA 'MOHICAN')                  |                   |                    |
| 14             | 1              | LSUM        | IRRIGATION SYSTEM RELOCATION/REPAIR, SITE                      |                   |                    |
| 15             | 1              | LSUM        | IRRIGATION SYSTEM RELOCATION/REPAIR, LANDSCAPING               |                   |                    |
| 16             | 1              | LSUM        | SITE RESTORATION/CLEANUP                                       |                   |                    |

**Total Bid for Project (Items 1 through 16, inclusive)**

\$ \_\_\_\_\_

**DOLLARS**

(write in amount)

Bidder guarantees that he or she has authority to submit this bid for the firm named below.

Submitted by:

|                                 |  |
|---------------------------------|--|
| _____<br>Signature              | _____<br>Company Name                                |
| _____<br>Name and Title (Print) | _____<br>Company Address                             |
| _____<br>Phone                  | _____<br>City, State, Zip                            |
| _____<br>Email                  | _____<br>Sole proprietorship/partnership/corporation |
|                                 | _____<br>If corporation, state of corporation        |

REFERENCES: (include name of organization, address, contact person, daytime phone number, and length of time services have been performed).

1. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

SUBCONTRACTORS: (include name of organization, address, contact person, daytime phone number, and services to be performed).

1. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

SCHEDULE: (Contractor shall provide anticipated start date and date of substantial completion below)

Start Date: \_\_\_\_\_

Substantial Completion Date: \_\_\_\_\_



**Index of Specifications, Special Provisions and Clauses  
2017 Bryan Crough Memorial Project  
City of Traverse City**

Work Item Descriptions  
Progress Clause  
Coordination Clause

Technical Specification: Site Preparation  
Technical Specification: Concrete Work  
Technical Specification: Clay Brick Pavers  
Technical Specification: Replacement and Cleanup

Special Provision: Sidewalk Remove  
Special Provision: Irrigation System

Appendix A

CITY OF TRAVERSE CITY  
WORK ITEM DESCRIPTIONS  
FOR  
**2017 BRYAN CROUGH MEMORIAL PROJECT**

ARY/CITY OF TRAVERSE CITY

1 of 3

03-08-17

The contractor shall furnish all labor, materials, equipment, tools, transportation, and necessary supplies, and perform all operations required to complete the work in accordance with the plans and the specifications. The OWNER will make no allowances for items not included in the bid.

The following work items shall be in accordance with the plans, specifications and in accordance with the following:

MOBILIZATION/TRAFFIC CONTROL/SITE PREPARATION: This item shall include furnishing of all equipment, labor and materials necessary to mobilize to the work location, provide site security and fencing, provide traffic control for motorized and non-motorized traffic per the Michigan Manual of Uniform Traffic Control Devices, provide site preparation in accordance with the Technical Specification for Site Preparation and any other work not specifically mentioned and not included in other items of work. Measured and paid for on a lump sum basis.

SIDEWALK, REM

This item shall include the furnishing of all equipment, labor and materials necessary to remove and dispose of existing concrete sidewalk in accordance with the Special Provision for Sidewalk Remove. Measured and paid for by the square yard.

CURB AND GUTTER, CONC, DET E2, MODIFIED

This item shall include the furnishing of all equipment, labor and materials necessary to construct curb and gutter, conc, det E2, modified as shown on the plans and in accordance with the Technical Speciation for Concrete Work and section 802 of the MDOT Standard Specifications for Construction. The Contractor shall provide layout and construction staking for the work. Measure and paid for by the foot on the centerline of the curb.

CONC., 6 INCH, NON-REINFORCED, SIDEWALK / ADA RAMPS, DRIVEWAYS: This item shall include the furnishing of all equipment, labor and materials necessary to form, place, finish, cure and protect new 6" concrete sidewalk / drive / ADA ramp, driveways. Work item includes excavation, up to 6" of sand fill, and compaction of subgrade. The Engineer will provide the alignment for the sidewalks. The Contractor shall provide layout and construction staking. Sidewalk must meet ADA standards with a 1.5% cross slope for drainage. Measured and paid for by the square foot.

SCULPTURE FOOTING AND SLAB ON GRADE: This item shall include the furnishing of all equipment, labor and materials necessary to construct the sculpture footing and slab on grade in accordance with plan sheets S0.00, S1.00, S2.00 and S3.00. The dimension of the slab on grade is 14'-6". The slab shall be sloped radially at 1.5% for drainage. The City Engineer will provide the center point of the sculpture footing and slab on grade. The Contractor shall provide layout and construction staking for the work. The Contractor shall provide shop drawings per sheet S0.00 for approval by the Artist and the Artist's Engineer prior to construction. The Contractor shall provide wet curing of the slab on grade as specified on Sheet S0.00. The Poly Burlap shall meet or exceed

ASTM C 156 and ASTM C 171. Burlap must be free of sizing or any substance that is harmful to concrete or causes discoloration. New burlap shall be thoroughly rinsed in water to remove soluble substances and make the burlap more absorbent. Burlap shall be placed as soon as the concrete has hardened sufficiently to prevent surface damage. Care shall be taken to cover the entire surface, including the edges of the slab. Contractor shall maintain moisture for a period of 7 calendar days. Alternate cycles of wetting and drying during the early curing period may cause crazing of the surface. The Artist will install the Steel Coils and Sculpture. The slab shall cure for 3 to 4 weeks prior to installation of the sculpture. The Sculpture is expected to arrive on site on June 1, 2017. Measured and paid for on a lump sum basis.

#### BRICK PAVERS, NONVEHICULAR, SALVAGED

This item shall include the furnishing of all equipment, labor and materials necessary to excavate, compact the subgrade, place and compact the base, place and compact the sand setting bed, place and cut the brick as needed, place and broom the joint sand. The City will provide and deliver reclaimed brick to the site for Contractors use. The brick pattern shall be running bond in a circular pattern. Measured and paid for by the square foot.

#### SUBGRADE UNDERCUTTING, TYPE CL II

This item shall include the furnishing of all equipment, labor and materials necessary to excavate and place class II granular material per section 205 of the MDOT 2012 Standard Specifications for Construction as directed by the City Engineer. This pay item is to be used when the City Engineer determines that existing soils (subgrade) after excavation for other pay items are unsuitable and need to be replaced with class II sand. Measure and paid for by the cubic yard.

#### IRRIGATION SYSTEM RELOCATION / REPAIR, SITE

This item shall include the furnishing of all equipment, labor and materials necessary to amend the existing irrigation system around the proposed sculpture footing, slab on grade, E2 curb, brick pavers and proposed sidewalks. The approximate location of the existing irrigation system is shown on the plans. The City will flag the locations of existing spray heads. The Contractor shall carefully locate existing pipes and valves as needed. The Contractor shall relocate valves that will be under proposed hardscape for future maintenance and servicing. The Contractor shall amend the piping that will be in conflict with the sculpture footing and E2 curb. The Contractor shall move spray heads as shown on the plans or as determined on site by the City Engineer. Existing spray heads are to be reused. If new spray heads are required the City will provide them. The irrigation system is currently winterized and will remain so until the amendments are made. The City will coordinate with the Contractor to turn on the system and verify that the system is functioning as amended. Measure and paid for on a lump sum basis.

#### IRRIGATION SYSTEM RELOCATION / REPAIR, LANDSCAPING

This item shall include the furnishing of all equipment, labor and materials necessary to amend the existing irrigation system for the proposed landscaping. The approximate location of the existing irrigation system is shown on the plans. The City will flag the locations of existing spray heads. The Contractor shall carefully locate existing pipes and valves as needed. The Contractor shall relocate valves and install new piping to match existing to service the proposed landscaping as shown on the plans or as directed by the City Engineer. The Contractor shall move existing spray heads as shown on the plans or as determined on site by the City Engineer. Existing spray heads are to be reused. If

new spray heads are required the City will provide them. The irrigation system is currently winterized and will remain so until the amendments are made. The City will coordinate with the Contractor to turn on the system and verify that the system is functioning as amended. Measure and paid for on a lump sum basis.

SITE RESTORATION / CLEAN UP This item shall include the furnishing of all equipment, labor and materials necessary to restore the site per the Technical Specifications for Replacement and Cleanup. Restoration shall include all areas that are disturbed during construction including amendments to the existing irrigation system. Contractor shall provide grade transitions that are "mowable" with a standard push lawn mower as determined by the Engineer. Contractor shall roll placed topsoil to provide slight compaction before application of seed, fertilizer and mulch. Contractor shall provide staked biodegradable mulch blanket as directed by the Engineer. Additional site restoration may be required after the Artist has erected and finalized the sculpture just prior to the dedication on June 13, 2017. Measured and paid for on a lump sum basis.

#### SHOP DRAWING REQUIREMENTS

Contractor shall provide shop drawings or submittals for the following items or as directed by the Engineer. List is not all inclusive and other submittals may be required:

- a. Concrete mix designs
- b. Concrete curing compounds and methods
- c. Shop drawing requirements per sheet S0.00 (to be approved by the Artist)

CITY OF TRAVERSE CITY  
PROGRESS CLAUSE  
FOR  
**2017 BRYAN CROUGH MEMORIAL PROJECT**

ARY/CITY OF TRAVERSE CITY

1 of 1

03-07-17

The Contractor shall start work after receiving Notice to Proceed.

The entire project shall be completed on or before the date specified in the Notice to Proceed. The intent of the City is to have this project completed by June 9<sup>th</sup> in time for the Bryan Crough memorial dedication to be held on June 13, 2017 in Lay Park.

The intent is to have the site ready for the Sculpture to be delivered on June 1, 2017. The sculpture footing and slab shall sure for a minimum of 3 weeks prior to June 1, 2017 (see work item description). The Contractor shall provide shop drawings per the plans and specifications as soon as possible for approval by the Artist and City Engineer.

The approved low bidder(s) for the work covered by this proposal shall participate in a pre-construction meeting with The City of Traverse City. The approved low bidder(s) shall provide the City a detailed Progress Schedule at the pre-construction meeting.

The subcontractor(s) are recommended to be at the scheduled meeting if such items materially affect the work schedule. The City will arrange the time and place for the meeting.

The Progress Schedule shall include, as a minimum, the controlling work items for completion of the project and the planned dates (or work day for a workday project) that these work items will be controlling operations. The final project completion date shall also be included in the Progress Schedule.

Failure on the part of the Contractor to carry out the provisions of the Progress Schedule, as established, may be considered sufficient cause to prevent bidding future projects until a satisfactory rate of progress is again established.

CITY OF TRAVERSE CITY  
COORDINATION CLAUSE  
FOR  
**2017 BYRAN CROUGH MEMORIAL PROJECT**

ARY/CITY OF TRAVERSE CITY

1 of 1

03-08-2017

DESCRIPTION

The contractor shall cooperate and coordinate construction activities with the owners of utilities and DeWitt Godfrey (the Artist) as stated in Section 104.08 of the 2012 MDOT Standard Specifications for Construction. In addition, for the protection of underground utilities, the contractor shall follow the requirements in Section 107.12 of the 2012 MDOT Standard Specifications for Construction.

PUBLIC UTILITIES

The following Public Utilities may have facilities located within the Right-of-Way:

City of Traverse City  
Justin Roy  
507 Hannah  
Traverse City, MI  
231-922-4923

Traverse City Light and Power  
Tony Chartrand  
1131 Hastings  
Traverse City, MI  
231-932-4562

Consumers Energy  
Greg Mortensen  
821 Hastings Street  
Traverse City, MI  
1-800-477-5050

Ameritech  
Kathleen Dohm-Beiser  
142 E. State Street  
Traverse City, MI  
231-941-2734

Michigan Consolidated Gas  
Matthew Logan  
1011 Hastings Street  
Traverse City, MI  
231-258-3785

Charter Communications  
Kevin Morrison  
701 S. Airport Rd., West  
Traverse City, MI  
800-545-0994

ARTIST

DeWitt Godfrey, Professor of Art  
Chair, Art and Art History  
301 Little Hall  
Colgate University  
13 Oak Drive  
Hamilton, NY 13346  
315-228-7593  
dgodfrey@colgate.edu

## **TECHNICAL SPECIFICATIONS FOR SITE PREPARATION**

### 1. SCOPE:

The work covered by this section shall consist of furnishing all materials, equipment and labor necessary to accomplish site preparation including but not limited to removal of miscellaneous items, demolition, excavation, filling and grading to achieve grades as shown or indicated on the plans and referred to in these specifications.

### 2. PROTECTION OF EXISTING IMPROVEMENTS:

Provide protection necessary to prevent damage to existing improvements designated to remain in place. Protect improvements on adjoining properties and on the Owner's property. Restore damaged improvements to their original conditions as directed by the Engineer.

### 3. PROTECTION OF EXISTING TREES AND VEGETATION:

- A. Protect existing trees and other vegetation indicated to remain in place against unnecessary cutting, breaking or skinning of roots, skinning and bruising of bark, smothering of trees by stockpiling construction materials or excavated material within the drip line. Also prevent excess foot or vehicular traffic or parking of vehicles within drip line by providing temporary guards to protect trees and vegetation to be left standing.
- B. Provide protection for roots greater than 1½ inch in diameter which are cut during construction operations. Coat cut faces with an emulsified asphalt or other acceptable coating formulated for use on damaged plant tissues. Temporarily cover exposed roots with wet burlap to prevent roots from drying out; cover with earth as soon as possible.
- C. Repair or replace trees and vegetation designated to remain which are damaged by construction operations in a manner acceptable to the Engineer.
- D. Water trees and other vegetation that are required to remain within the limits of the contract work area to maintain their health during the course of construction operations.

### 4. SITE CLEARING:

- A. Remove vegetation, improvements or obstructions interfering with installation of new construction. Remove such items elsewhere on the site or premises as specifically indicated. Removal includes digging out stumps and roots.

- B. Carefully and cleanly cut roots and branches of trees indicated to be left standing where such roots and branches obstruct new construction. Coat cut faces as directed by the Engineer.

5. CLEARING AND GRUBBING:

- A. Clear indicated areas of the project site of trees, shrubs and other vegetation, except for those indicated to be left standing.
- B. Completely remove stumps, roots and other debris protruding through the ground surface. Use only hand methods for grubbing inside the drip line of trees indicated to be left standing.
- C. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated. Place fill material in horizontal layers not exceeding 9 inches loose depth, and thoroughly compact to a density equal to the adjacent original ground.

6. DEMOLITION:

- A. Demolition work applies to any existing structure, above or below ground, that is to be removed as shown on the drawings and specified herein.
- B. The Contractor shall remove existing below-grade utilities and improvements necessary to permit proposed construction. Below-grade utilities and improvements shall be removed only to excavation limits for proposed construction.
- C. Fill depressions caused by demolition operations with satisfactory soil material unless further excavation or earthwork is indicated. Place fill material in horizontal layers not exceeding 9 inches loose depth, and thoroughly compact to 95% of maximum density.

7. SELECTIVE DEMOLITION:

- A. The extent of selective demolition work is as shown on the drawings and specified herein. Engage only subcontractors who can demonstrate not less than five (5) years successful experience in work of similar character.
- B. Performance Criteria:
  - 1. Requirements for structural work: Do not cut and patch structural work in a manner resulting in a reduction of load-carrying capacity or load/deflection ratio.



2. Operational and safety limitations: Do not cut and patch operational elements and safety-related components in a manner resulting in a reduction of capacities to perform in the manner intended or resulting in decreased operational life, increased maintenance or decreased safety.
3. Visual requirements: Do not cut and patch work which is exposed on the exterior or in occupied spaces in a manner resulting in a reduction of visual qualities or resulting in substantial evidence of the cut and patch work.

C. Job Conditions:

The Owner assumes no responsibility for the actual condition of structures to be demolished. Items of salvageable value to the Contractor may be removed from the structure as the work progresses if not claimed by the Owner. Salvaged items must be transported from the site as they are removed. Carefully remove, clean, crate and store salvaged material claimed by the Owner as directed by the Engineer. Ensure the safe passage of persons around the area of demolition. Conduct operations to prevent injury to adjacent buildings, structures, and facilities, and persons.

D. Materials:

Except as otherwise indicated or approved by the Engineer, provide materials for cutting and patching which will result in equal or better work than the work being cut and patched in terms of performance characteristics and including visual effect where applicable.

Comply with the requirements and use materials identical to the original materials where feasible and where recognized that satisfactory results can be produced thereby.

E. Preparation:

Provide adequate temporary support for work to be cut to prevent failure. Do not endanger other work. Provide adequate protection of other work during selective demolition to prevent damage, and provide protection of the work from adverse weather exposure.

F. Procedures:

Employ only skilled tradesmen to perform selective demolition. In general, where physical cutting action is required, cut work with sawing and grinding tools and

not with hammering and chopping tools. Core drill openings through concrete work.

Patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the work. Restore exposed finishes of patched areas, and, where necessary, extend finish restoration onto adjoining retained work in a manner which will eliminate evidence of patching.

Where selective demolition terminates at a surface, finish or substrate to remain, completely remove all traces of material selectively demolished including mortar beds. Provide smooth, even substrate transition.

Use temporary enclosures and other suitable methods to limit the amount of dust and dirt rising and scattering in the air.

Clean adjacent portion of the structure and improvements of dust, dirt, and other debris caused by demolition operations as directed by the Engineer. Return adjacent areas to the condition existing prior to the start of the work.

## 8. REMOVAL OF MISCELLANEOUS ITEMS

- A. Remove existing pavements, curbing, sidewalk, fencing and miscellaneous items to prepare the site for the proposed work as shown on the plans and as directed by the Engineer. Sawcut existing items at the work limits. Use water equipped saws to limit dust from sawing work.

## 9. DISPOSAL OF WASTE MATERIALS:

Contractor shall be responsible for removal of all waste materials and unsuitable soils from the project site and dispose of legally off the site.

## 10. EXCAVATION:

- A. All unsatisfactory soil material, such as muck, peat or organic material, within the grading limits shall be excavated and removed from the site. The Contractor should visit the site and acquaint himself with all existing conditions prior to bidding. Bidders may make their own subsurface investigation to satisfy themselves as to site and subsurface conditions.
- B. Notify "MISS DIG" before excavating. Locate existing utilities by hand-excavation as required, and protect them from damage. Should uncharted or incorrectly charted utilities be encountered during excavation, consult the utility owner and the Engineer immediately for directions.

- C. Cooperate with the Engineer and utility companies in order to keep services in operation. Do not interrupt utility connections without providing temporary utility services acceptable to the Engineer. Repair damaged utilities to the satisfaction of the utility owner and the Engineer.

11. ON-SITE FILL MATERIALS:

On-site fill materials shall be soil or soil-rock mixture which is free from organic matter and other deleterious substance; it shall contain no rocks or lumps over 6 inches in greatest dimension, and not more than 15% of the rocks or lumps shall be larger than 2½ inches in greatest dimension.

12. IMPORTED FILL MATERIALS:

Imported fill materials shall be pit-run sand or gravelly sand with a maximum particle size of 2 inches and not more than 12% finer than 75 microns (200 mesh sieve) unless otherwise specified by the Engineer. Clay, silt, peat or other organic soils, rubble, debris, etc., as defined by the Engineer, will not be accepted as imported fill.

13. DRAINAGE FILL MATERIALS:

For drainage fill behind retaining walls or other structures, provide clean imported gravel where shown on the drawings as drainage zones. Provide material that has been sampled, tested and approved. The gravel provided shall be Type 34R open-graded aggregate as described in the latest edition of the MDOT Standard Specifications.

14. FILL MATERIAL APPROVAL:

- A. For approval of imported fill material, notify the Engineer at least five (5) working days in advance of intention to import material, designate the proposed area from which fill material is to be imported and provide a representative sample of the imported fill to the Engineer for the purpose of performing acceptance tests to establish the quality of the material. Notify the Engineer at least two (2) full working days prior to commencing filling operations.
- B. All fill material used under pavement shall meet the requirements of the imported fill materials.
- C. All other materials not specifically described but required for proper completion of the work of this section shall be selected by the Contractor subject to the approval of the Engineer.

15. PREPARATION OF SUBGRADE:

After the site has been cleared and stripped, any unsatisfactory material has been excavated and the site filled and compacted to the specified levels, scarify all exposed soil surfaces to a minimum depth of six (6") inches, moisture-condition if necessary and compact to the requirements specified herein. The work covered in the section shall conform to the MDOT Standard Specifications for Construction, latest edition.

16. FILL AND COMPACTION:

- A. After subgrade compaction has been approved by the Engineer, spread approved fill material.
- B. All fill material placed in the work site shall be approved clean, inorganic material meeting these specifications and shall be laid in lifts of 9 inches maximum loose thickness and compacted to the herein-designated percentage of the maximum density obtained in the laboratory on a representative sample of that soil using the Standard Proctor Test procedure (ASTM D698) or Michigan Cone Method. The Contractor shall exercise control of moisture at his expense in order to achieve the minimum degree of compaction as required herein. All compacted fill shall extend down to an approved surface of suitable natural material. The compaction equipment shall be appropriate for the intended use. If the Contractor wishes to use thicker lifts than those specified, he should demonstrate that the compaction will uniformly achieve the specified compaction throughout the entire lift thickness to the satisfaction of the Engineer.

17. DEGREE OF COMPACTION REQUIREMENTS:

- A. Compact all fill to 95% under pavements, curbs, shoulders, drives, sidewalks, structures or where such items are undercut by the excavation or where noted on the plans.
- B. Fill under lawns and in other such areas, as designated on the drawings, shall be compacted by soil compactors or by the wheels or track of the earth-moving equipment in lifts of 24 inches maximum thickness. A minimum density requirement of 85% applies to these fills.

18. GRADING:

Except as otherwise directed by the Engineer, perform all rough and finish grading required to obtain the elevations indicated on the drawings.

19. GRADING TOLERANCES:

Rough grade for roads and parking areas shall be  $\pm 0.1$  foot; finish grade for landscaped areas shall be  $\pm 0.2$  foot.

20. TREATMENT AFTER COMPLETION OF GRADING:

After grading is completed and the Engineer has finished his inspection, no further excavation, filling or grading will be permitted except with written approval of the Engineer. Use all means necessary to prevent erosion of freshly graded areas during construction and until such time as permanent drainage and erosion control measures have been installed as herein specified.

21. OTHER DEBRIS:

Upon completion of the work the Contractor shall, as directed by the Engineer, remove from the vicinity of the work all equipment and all temporary structures, waste materials and rubbish resulting from his operations, leaving the premises in a neat and presentable condition. In the event of his failure to do so, the same may be done by the City at the expense of the Contractor.

22. MEASUREMENT AND PAYMENT:

The work included in this specification shall be measured and paid included in the following pay items which shall include all labor, materials and equipment necessary to complete the work, whether specifically mentioned or implied:

A. Site Preparation:

Site Preparation shall include removal of miscellaneous items, saw-cutting earthwork, grading, backfill and all work to prepare the site for the proposed work that is not paid for separately.

## **TECHNICAL SPECIFICATIONS FOR CONCRETE WORK**

1. SCOPE OF WORK:

The work under this section shall include all materials, labor and equipment necessary to complete all of the concrete work, including but not limited to the items in these specifications and those shown on the working drawings.

2. GENERAL:

All procedures and materials under this section, where not specifically stated, shall be in accordance with standards and recommendations of the American Concrete Institute's "Building Code Requirements for Reinforced Concrete" (ACI 318, latest edition); "Specifications for Structural Concrete Buildings," (ACI 301, latest edition); 2012 Standard Specifications for Construction of the Michigan Department of Transportation.

3. MATERIALS AND PRODUCTS:

- A. Portland Cement shall conform to "Standard Specifications for Portland Cement" (ASTM C150, latest edition) or "Specifications for Air-Entrained Portland Cement" (ASTM C175, latest edition) and shall be Type 1A.
- B. Concrete aggregates shall conform to "Standard Specifications for Concrete Aggregates" (ASTM C33, latest edition).
- C. All water used in concrete shall be from a potable water supply.
- D. Air-entraining admixtures shall conform to "Standard Specifications for Air-Entrained Admixtures for Concrete" (ASTM C260, latest edition).
- E. Water-reducing admixture shall conform to ASTM C494. Only use admixtures which have been tested and accepted in mix designs, unless otherwise acceptable in writing by the Engineer.
- F. Moisture barrier shall be clear 4 mils thick polyethylene. Membrane-forming curing compound shall be ASTM C309, Type 1, white membranous curing compound and applied in accordance with MDOT Standard Specification Section 602, 2012 Edition.
- G. Expansion Joint Filler shall be pre-formed joint filler conforming to ASTM D1751 or D1752, or shall be resin-impregnated fiberboard conforming to physical

requirements of ASTM D1752, and shall be 1 inch thick unless otherwise indicated on the drawings.

- H. Steel reinforcing bars shall conform to ASTM A615, Grade 40, ASTM A616, Grade 50, or ASTM A617, Grade 40. A minimum cover of 3 inches is required on horizontal and vertical surfaces.
- I. Welded wire fabric shall conform to ASTM A185.
- J. Concrete for this project, unless specified otherwise or modified herein, shall be transit mixed concrete from an approved mixing plant. Concrete shall be mixed and delivered in accordance with the requirements of ASTM C94, "Standard Specifications for Ready Mixed Concrete." Each cubic yard of concrete shall have a minimum compressive strength of 4000 psi at 28 days, an air-entraining content of 6.5 + 1.5%, and a maximum 4-inch slump. Aggregates shall meet the current ASTM C33 Standard for severe exposure conditions.

4. CONCRETE MIX PROPORTIONS:

One month prior to placement of concrete, unless otherwise approved by the Engineer, mix proportions and trial batch test results (including 28-day compressive strength tests) shall be submitted to the Engineer for his review and approval. The trial batch shall be prepared by an agency acceptable to the Engineer, and shall be proportioned to meet the herein specified slump, air content and compressive strength requirements.

5. MIXING CONCRETE:

- A. Mixing and transporting equipment for ready-mixed concrete shall be capable of providing concrete which meets the ASTM C94 requirements for uniformity.
- B. For job-mixed concrete, when approved by the Engineer, the mixer shall be rotated at a speed recommended by the manufacturer. If mixer performance tests are not made, each batch of 1 cubic yard or less shall be mixed for at least 2 minutes after all materials are in the mixer. The mixing time shall be increased by 15 seconds for each additional cubic yard or fraction thereof. The entire batch shall be discharged before the mixer is recharged.

6. CONVEYING CONCRETE:

- A. Concrete shall be conveyed from the mixer to the place of final deposit by methods that will prevent separation or loss of materials.

- B. Equipment for chuting, pumping, and pneumatically conveying concrete shall be of such size and design as to ensure a practically continuous flow of concrete at the delivery end without separation of materials.

7. PREPARATION OF EQUIPMENT AND PLACE OF DEPOSIT:

- A. Before placement, all equipment for mixing and transport of the concrete shall be cleaned, and all debris and ice shall be removed from the places to be occupied by the concrete. Forms shall be thoroughly wetted (except in freezing weather) or oiled, and masonry filler units that will be in contact with concrete shall be well-drenched (except in freezing weather).
- B. Water shall be removed from place of deposit before concrete is placed unless otherwise permitted by the Engineer. All latents and other unsound material shall be removed from hardened concrete before additional concrete is added.

8. FORM WORK:

- A. All form-work shall be constructed so that concrete members and structures are of correct size, shape, alignment, elevation and position. Side forms shall be of wood or metal straight and free from warp and of sufficient strength to resist springing when the concrete is placed against them. Forms shall be firmly staked to such line and grade so that the surface and width will conform with the surface and width of the adjacent work or as directed by the Engineer, and shall provide for a transverse slope so as to conform with the slope of the adjacent work or as indicated on the drawings. All forms must be inspected and approved by the Engineering Department before concrete is placed therein.
- B. Clean and adjust forms prior to concrete placement. Apply form release agents or wet forms, as required. Re-tighten forms during concrete placement if required to eliminate mortar leaks.
- C. Set and build into work anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting diagrams, templates and instructions provided by others for locating and setting.

9. STEEL REINFORCMENT:

- A. The Contractor shall furnish, cut, bend and place all steel reinforcement as indicated on the drawings or as otherwise required. When surrounding concrete is place, all reinforcement shall be free from loose flaky rust and scale and free from oil, grease or other coating which might destroy or reduce its bond with the concrete. Position, support and secure reinforcement against displacement. Locate and support with metal chairs, runners, bolsters, spacers and hangers as



required. Set wire ties so that ends are directed into concrete, not toward exposed concrete surfaces.

- B. All spliced bars shall be lapped a minimum of 24 bar diameters or as shown on the drawings. The lapped ends of bars may be separated sufficiently to permit embedment of the entire surface of the bar in concrete, or may be securely wired together. Butt-welding of bars in lieu of lapping will not be permitted.
- C. Before placing concrete, care shall be taken to determine that all embedded items are firmly and securely fastened in place as indicated on the drawings. Embedded items shall be free of oil and other foreign matter such as loose coatings of rust, paint and scale. The embedding of wood in the concrete will not be permitted.
- D. Install welded wire fabric in as long lengths as is practicable, lapping at least one mesh.

10. PLACING CONCRETE:

- A. The required curing compound in sufficient quantity to complete the pour along with all necessary application equipment shall be on site and approved by the Engineer prior to ordering and/or placing any concrete.
- B. Concrete shall be worked into the corners and angles of the forms and around all reinforcements without permitting the materials to segregate. Concrete shall be placed within 30 minutes after it has been mixed unless otherwise authorized. It shall be placed on clean, damp surfaces free from water, ice, frost, mud debris or objectionable coatings. The placement shall be carried on at such a rate that the formation of cold joints will be prevented. All concrete placing equipment and methods shall be subject to approval of the Engineer.
- C. Samples of concrete shall be taken in the field from mixtures used to determine the adequacy of control of materials and the slump, consistency, compressive strength and air content of the concrete in accordance with ASTM C360. The Owner shall furnish all material, concrete technicians, labor and facilities required for molding and curing test specimens at the site. Molding, curing and testing shall be performed by the Engineer. The Owner reserves the right to require the Contractor to mold and test additional specimens as it considers necessary. Additional tests which fail to achieve results established under the design mix shall be paid for by the Contractor. Additional tests which do achieve results established under the design will be paid for by the Owner.
- D. The following procedure shall be followed in restoring or replacing any Portland Cement concrete street, driveway or alley wearing surface:

Backfill trench and compact sub-base as directed by the Engineer. The condition of the base shall be approved by the Engineer before concrete is placed thereon. Place the mixed Portland Cement concrete on the base and distribute to such depth and sufficiently above grade so that when consolidated and finished, the surface shall conform to the surface of the adjacent pavement. The finished patch shall have a thickness of not less than the thickness of the original pavement or a minimum of 9 inches in streets.

Consolidate the concrete within the entire area of the patch by means of either hand-spading or use of a mechanical vibrator so as to assure a minimum of voids. Strike off flush with the surface of the adjacent pavement. The strike board shall be moved forward with a combined longitudinal and transverse motion, the manipulation being such that neither end is raised from the adjacent pavement during the process. A slight excess of concrete shall be kept ahead of the cutting edge at all times.

After striking off, the surface shall be made uniform by longitudinal or transverse floating.

The concrete shall be cured as specified in MDOT Specification Section 602 or as directed by the Engineer. The curing process shall be pursued for a period of not less than 48 hours after pouring the concrete at which time the street may be opened to traffic.

The Engineer may require the use of an approved bonding agent so as to assure a lasting bond between the patch and the adjacent pavement.

## 11. JOINTS:

All joints shall conform to the details and shall be constructed in the locations as specified or indicated on the drawings. All equipment and methods used in forming or cutting of joints shall be approved by the Engineer.

### A. Expansion Joints:

Expansion joints shall be placed as shown on the drawings and as specified herein. Devices used for installation of the joints shall be adequate to hold the parts of the joint in proper position and protect the filler from damage during concreting operations. Adjacent sections of filler shall be fitted tightly together and held in line to ensure continuity and prevent any concrete from entering the expansion space. Any concrete which has flowed into a gap between an expansion joint strip and the edge forms of the concrete shall be cut out immediately after the forms have been removed. Expansion joints shall form a complete and uniform separation between the adjoining sections.

B. Construction Joints:

Transverse construction joints shall be installed at the end of a day's placing operations and at any other point when concrete placement is interrupted for 30 minutes or longer.

C. Contraction Joints for Sidewalks & Slabs:

Longitudinal contraction joints shall be of the weakened plane or dummy type. Joints shall be constructed true-to-line with their faces perpendicular to the surface of the sidewalk or curb line. Transverse joints shall be constructed at right angles to the centerline, and longitudinal joints shall be constructed parallel to the centerline, unless otherwise required. In sidewalks having an overall width of 5 feet, transverse contraction joints shall be constructed at intervals of 5 feet. All contraction joints shall be produced by the use of slab division forms extending to the full depth of the concrete or by cutting joints in the concrete, after floating, to a depth of not less than  $\frac{1}{4}$  the thickness of the sidewalk. The cut joints shall not be less than  $\frac{1}{8}$  inch nor more than  $\frac{1}{4}$  inch in width and shall be finished smooth and true to line. The concrete at the faces of all joints shall be thoroughly spaded and compacted to fill all voids, and the surface shall be finished smooth and true to grade. All joints are incidental to concrete work.

D. Expansion Joints for Sidewalks:

1-inch transverse joints shall be placed through concrete sidewalk in line with all expansion joints in the adjacent curb, gutter or combination curb and gutter.

$\frac{1}{2}$ -inch expansion joints shall be placed between the sidewalk and back of adjacent parallel curb or gutter and between the sidewalk and buildings or other rigid structures. When directed by the Engineer, the expansion joint between sidewalks and buildings shall be placed one foot from the property line and parallel to it.

$\frac{1}{2}$ -inch transverse expansion joints shall be placed through concrete sidewalk in line with back of adjacent sidewalk when pouring sidewalk around a corner at intersections. When pouring crosswalks out to the curb line at intersections in conjunction with installation of new sidewalk around a corner,  $\frac{1}{2}$ -inch expansion joints shall be placed through concrete sidewalk in line with the back of both adjacent sidewalks.

E. Joints Around Trees:

Where trees occur within 3 feet of the sidewalk on either side of the sidewalk, the sidewalk shall be divided as follows:

½-inch expansion joints shall be placed along the centerline of the sidewalk and parallel with the edge of the sidewalk, 5 feet on either side of the tree.

½-inch transverse expansion joints shall be placed at 5 feet either side of the tree from the edge of the sidewalk nearest the tree to the expansion joint on the centerline of the sidewalk.

A transverse cut joint shall be made from the centerline of the sidewalk to the edge of the sidewalk opposite the side of the tree 5 feet either side of the tree and a cut joint the full width of the sidewalk directly opposite the tree.

The cut joints shall not be less than 1/8 inch nor more than ¼ inch in width and shall be finished smooth and true-to-line to a depth of not less than ¼ the thickness of the sidewalk.

F. Joints for Curb and Gutter Work:

Expansion joints composed of pre-molded joint filler shall be used. All such materials shall be of one piece ½ inch thick and shall occupy the full cross section of the curb and gutter. Joints shall be placed at intervals of not more than 60 feet (100 feet for paving machine) and at the ends of each curve, driveway or alley opening. A joint shall be provided for the full sidewalk section where a new piece of walk adjoins a curb. Joints will be considered as paid for in the unit prices for concrete items. Concrete widening shall match as well as possible the joints in the existing pavement. Steel divider plates shall be used at the end of each pour. 1½-inch tooled joints shall be placed at 10-foot intervals.

12. CURB OPENINGS:

Unless otherwise indicated on the plans or directed by the Engineer, curb openings shall be constructed by dropping off the 6" x 6" curb in a length of 18 inches with radii top and bottom. The bottom width of such openings shall generally be 14 feet for driveways and 24 feet for alleys. There shall be a 1½-inch slope from the gutter line up to the back of the concrete. No special payment will be made for these openings. They will be measured as curb and gutter and the Contractor shall place sufficient gravel behind them to permit use after the concrete is seven days old.

13. SEALING JOINTS:

Unless otherwise approved by the Engineer, all joints shall be sealed in accordance with Section 602 of the MDOT Standard Specifications for Construction, 2012 edition. The

joints shall be sealed immediately following the curing period or as soon thereafter as the weather conditions permit, as directed by the Contracting Officer. Immediately before installing the sealer, joints shall be thoroughly cleaned and shall be free from concrete, dust, dirt or other objectionable material.

14. CONCRETE FINISHES:

A. Slab Trowel Finish:

Apply trowel finish to monolithic slab surfaces that are exposed to view. Screed fresh concrete to grade while placing within forms. Floating and troweling operations shall not begin until free water on the surface of the fresh concrete has disappeared. Water may not be sprayed onto fresh concrete to increase workability, nor may Portland Cement be applied to "dry up" the surface. Consolidate concrete surfaces by finish troweling, free of trowel marks, uniform in texture and appearance.

B. Edging and Final Finishing:

Unless otherwise directed by the Engineer, immediately after the initial finishing, the edges of the slab and all specified joints shall be finished with an edging tool. The pavements shall then be given a final finish by dragging a broom over the concrete surface and that portion of the pavement disturbed by the edging operation.

15. CURING AND PROTECTION:

A. General:

The Contractor shall have all equipment needed for adequate curing and protection of the concrete on hand and ready to install before actual concrete placement begins. The curing medium shall be applied so as to prevent loss of moisture from the concrete. All concrete shall be adequately protected from damage at all times.

B. Curing:

After the finishing operations have been completed and immediately after the free water has left the surface, the surface of the slab shall be completely coated and sealed with a uniform layer of white membranous curing compound, complying with ASTM C309, unless otherwise directed by the Engineer.

The compound shall be applied in a continuous uniform film by means of mechanically pumped pressure sprayer equipment at the rate directed by the Engineer, but not less than one gallon per 200 square feet of surface.

The equipment shall provide adequate stirring of the compound during application. The equipment for application of the compound must be on the project and approved by the Engineer before work is started. If rain falls on the newly coated pavement before the film has dried sufficiently to resist damage, or if the film is damaged in any other way, the Contractor will be required to apply a new coat of material to the affected areas equal in curing value to that specified for the original coat. The treated surface shall be protected by the Contractor from injury for a period of at least 7 days unless otherwise approved by the Engineer. All traffic, either foot or otherwise, will be considered as injurious to the film of the applied compound. A minimum of foot traffic will be permitted on the dried film as necessary to properly carry on the work, including the removal of any high spots, provided any damage to the film is immediately repaired by the application of a second coat of the compound. Immediately after the forms are removed, the entire area of the sides of the slab shall be coated with the curing compound at the rate specified for the pavement surface.

The Contractor shall provide on the project sufficient alternate coverings for the protection of the pavement in case of rain or breakdown of the spray equipment.

Failure to provide proper curing will be considered as sufficient cause for immediate suspension of the concreting operations.

C. Protection Against Accidents:

The Contractor shall furnish and maintain during the continuance of the work such barriers, lights and other protective devices and shall furnish such watchmen as will effectively prevent any accidents in consequence of his work; and he shall be liable for all accidents and damages occasioned in any way by his acts of neglect or by the acts or neglect of his sub-contractors, agents, employees or workmen.

It shall be the responsibility of the Contractor to plan his pours so the concrete will be sufficiently hardened before terminating work for that particular day. All surfaces of newly poured work shall be protected by the Contractor from any damage caused by pedestrians, vehicles, bikes, dogs and others until the concrete has sufficiently hardened.

D. Cold Weather Requirements:

Adequate equipment shall be provided for heating concrete materials and protecting concrete during freezing or near-freezing weather. No frozen materials or materials containing snow or ice shall be used.

All reinforcement, forms, fillers and ground with which the concrete is to come in contact shall be free from snow and ice.

Construction during cold weather shall be performed in accordance with ACI 306, "Recommended Practice for Cold Weather Concreting," as directed by the Engineer.

16. QUALITY CONTROL:

The Contractor shall establish and maintain a quality control system for all operations performed under this section to assure compliance with contract requirements and maintain records of his quality control for all operations performed including, but not limited to, the following:

- A. Composition, quality & testing of concrete material
- B. Gradation of concrete aggregates
- C. Form work
- D. Placement of reinforcing steel and embedded items
- E. Batching and mixing concrete
- F. Conveying and placing concrete
- G. Joint installation and treatment
- H. Finishing of concrete surfaces
- I. Curing and protection of concrete
- J. Dimension tolerances
- K. Observance of safety regulations

17. DEFECTIVE WORK:

- A. Any concrete that is found to be lacking in the requirements listed in this specification or of poor workmanship, and not approved by the Engineer shall be considered as Defective Concrete.
- B. Defective concrete, voids, honeycombing, ridges and local bulging on all concrete surfaces permanently exposed to view shall be repaired to the satisfaction of the Engineer after the removal of forms. Defective concrete shall be repaired by cutting out the unsatisfactory material and placing new concrete which shall be secured with keys, dovetails or anchors. Excessive rubbing of formed surfaces will not be permitted. All unformed surfaces of concrete, exposed in the completed work, shall have a broomed finish without additional mortar and shall be true to elevation as shown on the drawings. Other surfaces shall be brought to the specified elevations and left true and regular.

18. MEASUREMENT:

Only concrete acceptably placed or used will be measured for payment.

Measurement of concrete for payment will be made on the basis of those items listed in the proposal within the pay lines of the structures as indicated on the drawings or herein.



**TECHNICAL SPECIFICATIONS  
FOR CLAY BRICK PAVERS**

1. SCOPE OF WORK:

The work covered in this section shall consist of furnishing of all labor, materials and equipment, and performing all operations involved in the complete installation of all clay brick paving work in strict accordance with provisions of the plans and specifications.

2. GENERAL:

The following provisions apply to this section of the specifications:

- A. All materials unless otherwise indicated on the plans or authorized in writing by the Engineer shall be new and unused materials of the size and type shown on the plans and standard details, and shall conform to the requirements of the specifications.
- B. All clay brick pavers shall be manufactured from extruded fire-clay or shale and shall be fired to produce a dense paver. Brick will conform to ASTM designation section C902, 1984 Standards for Class 5X type brick sidewalks.

3. MATERIALS:

- A. Base: The base course for brick and concrete sidewalk areas shall be 4" of one hundred percent (100%) crushed 21A MDOT specification aggregate, compacted in place.
- B. Concrete base: the base course for brick crosswalks within the street shall be a minimum of 8 1/4" of air-entrained transit-mixed Portland Cement concrete from an approved mixing plant. Concrete quality is to be based on a 28-day ultimate compressive strength of 4000 psi 6-sack mix with a maximum of 5-1/2 gallons of water per 94-pound sack of cement, using a 6AA 100% crushed aggregate and having a maximum 4-inch slump and entrained air content range of 4.5% - 7.5%.
- C. Leveling Course Material: The leveling course for brick pavers shall be MDOT specification 2NS meeting the following gradation:

|            |      |        |       |        |        |        |        |         |
|------------|------|--------|-------|--------|--------|--------|--------|---------|
| Sieve Size | 3/8" | No. 4  | No. 8 | No. 16 | No. 30 | No. 50 | No.100 | No. 200 |
| % Passing  | 100  | 95-100 | 65-95 | 35-75  | 20-55  | 10-30  | 0-10   | 0-3     |

The leveling or bedding sand should be screeded to a loose thickness of one inch (1") conforming to the contour of the base surface.

- D. Bricks Shall Be: Clay brick pavers, four inches by eight inches (4" x 8") as indicated on paving patterns shown on plan. Colors are to be Old Smokie and Cocoa Velour, as manufactured by Glen-Gery Corporation, P.O. Box 8500 (S-

9405), Philadelphia, PA 19178-9405, or approved equal. For informational purposes, these products are locally supplied by Western Concrete Products Company, 1797 N. Park Drive, Traverse City, MI, 49686.

Pavers for pedestrian areas (on the sidewalk side of the curb) shall be two and one-quarter inches (2 1/4") thick with a compressive strength of eight thousand pounds per square inch (8,000 psi) minimum.

Pavers for vehicular areas (crosswalks in street) shall be two and three-fourths inches (2 3/4") thick with chamfered edges and a compressive strength of eight thousand pounds per square (8,000 psi) minimum.

Pavers for radius area of tree grates shall be wedge shaped in accordance with detail for tree grate pavers.

E. Joint Filler for Brick Pavers:

Portland Cement with prepared color added shall conform to ASTM C-150. Sand shall conform to ASTM C

4. CONSTRUCTION METHODS:

- A. Sub-Base Preparation: Prior to placement of the base, the Contractor shall level, fine-grade and compact the existing sand sub-base to ninety-five percent (95%) maximum density.
- B. Base: Spread to the thickness shown on the plans and compact to ninety-five percent (95%) maximum density at optimum moisture content. Any irregularities (peaks) must be removed and the base shall be sloped at minimum of one-fourth inch (1/4") per foot slope as indicated on the plans.
- C. Concrete Base: Form and pour to the thickness shown on the plans.
- D. Leveling Course: Spread a one inch (1") layer over the base and screed to match the required gradient, not to be compact or walked on. Sand shall be spread only over an area sufficient to be covered with pavers on the same day. Sand must be free of hollows or voids when pavers are laid.
- E. Brick Paver Installation: Brick installation shall begin from a corner, straight edge, or base line, in patterns shown on plan. String lines shall be used to insure that the paving stones will be set true to line and grade. Care shall be taken to insure that the pavement properly coincides and aligns with adjacent work lines and elevations. The bricks shall be placed "hand tight" and level on the loose base or leveling course. There will be cutting or clay brick pavers required to insure proper fit of paving patterns. All cutting is to be done with a masonry saw. Bonding shall be laid out to eliminate small filler pieces of clay brick pavers where possible. All paving patterns shall be reviewed thoroughly with Engineer prior to beginning work. It is extremely important that the leveling course not be disturbed and that individual bricks not be pre-compacted. A minimum of three passes of a plate vibrator shall be made to set the brick pavers in the leveling course, prior to filling the joints with sand. Vibrator must not be passed nearer than one (1) yard from an unrestrained edge. All voids and joints are to be filled by sweeping and vibrating in sand equal in gradation to the sand in the base or leveling course or slightly finer, one hundred percent (100%) passing the No. 16

sieve and ten percent (10%) passing the No. 200 sieve. Sweeping and vibration should be alternately continued until all joints are full. Pavement shall be swept clean and excess sand removed.

## **TECHNICAL SPECIFICATIONS FOR REPLACEMENT AND CLEANUP**

### 1. SCOPE OF WORK:

Under this item, the Contractor shall restore all lawns, trees, landscape plantings, sidewalks, ramps, fences, commercial signs, water courses, gravel, asphalt and concrete roads, catch basins, storm sewers, building sewers, water services, water valve boxes, meter vaults, property markers (e.g., concrete monuments, irons), mailboxes and other items which may be damaged during the course of construction. All replacement and cleanup work will be incidental to the project except those items of work that are listed in the bid proposal.

All restoration work shall attempt to return the existing facilities to their original condition. Substitutions, such as gravel instead of grass, will not be allowable.

Replacement and cleanup operations shall follow immediately behind the construction work. The Contractor shall make every effort to keep the job site clean and free of trash and miscellaneous building materials. The Contractor shall pay special attention in order to restore commercial signs, fences, etc., and to patch and repair pavement, driveways and sidewalks immediately after the construction work. In the event that replacement and cleanup work does not proceed in a satisfactory manner, the Owner may withhold periodic payments or close the construction until such time as the replacement and cleanup is satisfactory. An exception may be made if there are physical limitations, which do not allow for immediate replacement and cleanup.

### 2. PAVEMENT RESTORATION:

#### A. General:

PRE-QUALIFICATION OF THE PAVING CONTRACTOR BY THE  
MICHIGAN DEPARTMENT OF TRANSPORTATION IS REQUIRED PRIOR  
TO AWARD OF PAVING WORK.

All permanent pavement restoration shall be done over compacted backfill and a minimum eight (8") inches thick compacted MDOT 22A gravel base. The gravel base shall be placed and maintained in accordance with §302 of the 2012 MDOT Standard Specifications and will be considered incidental to pavement restoration. All patches shall have square, neat, saw-cut edges, cut as a minimum to the widths indicated on the plans, regardless of the final surfacing method planned for that section of the pavement restoration. Additional saw-cutting and/or bituminous patching outside of the limits shown on the plans as a result of construction damage and/or MIOSHA requirements shall be considered incidental.

No patching work shall be started until the sub grade has been properly prepared as outlined in the section for Excavating, Trenching & Backfilling of this Specification. Prior to laying the bituminous patch, the adjacent road surfaces shall be swept clean of all foreign materials and the patch area and pavement primed with MDOT's approved prime coat.

A bituminous bond coat shall be placed between successive lifts of the bituminous patch and bituminous surfacing. Each lift shall be thoroughly compacted before adding the next lift. This includes running the compaction roller longitudinally along the entire length of the joints between the patch and the existing pavement.

Temporary road patches shall be gravel or bituminous cold patch. The patches shall be maintained in a smooth condition until final repairs are made.

The Engineer shall be notified at least 48 hours prior to the placement of any and all final pavement overlays.

The Contractor shall maintain access, whenever possible for traffic for local residences, commercial establishments and deliveries, and for emergency vehicles.

The Contractor at his own expense shall replace existing castings damaged by the Contractor in the course of the work.

**B. Bituminous Patching:**

Existing asphalt roads and driveways shall be patched using MDOT Bituminous Surfacing Mixture 13A, unless otherwise specified on the drawings. All patches shall match the original width and depth of the asphalt and in no case a depth less than 1½ inches (165 pounds per square yard). Any asphalt patch that requires a depth greater than 2½ inches (275 pounds per square yard) shall be placed in two (2) lifts with the final course being no less than one (1") inch.

The bituminous materials for all wearing course surfaces shall be asphalt cement having a penetration grade of 85-100 and shall make up 5% to 7% of the total mixture. Failure of the Contractor to adhere to the required bitumen content as specified herein may result in an adjustment in contract prices, as determined by the City Engineer. The Engineer will evaluate such areas, and if, in his judgment, the defective areas warrant removal, the Contractor shall remove and replace the defective pavement with pavement meeting specification requirements. No payment will be made for the work of placing and removing the defective areas.

The composition of the bituminous concrete mixture for resurfacing shall conform to MDOT Specifications per Division 5 for 13A Bituminous Concrete.

The Bituminous Tack Coat shall be RC-70 or an approved equal and uniformly applied by means of a pressure distributor. Bituminous Tack Coats shall be applied at a rate of 0.05 gallons per square yard and shall have ample time to cure before any Bituminous Surface Course shall be applied.

Bituminous mixtures shall not be placed nor the Tack Coat applied when rain is threatening or when the surface to be treated is wet. Bituminous courses having a nominal application rate of 100 pounds per square yard or less shall not be placed when the air temperature is lower than 50° F and courses of greater depth when the air temperature is lower than 40° F, unless otherwise approved by the Engineer.

All loads shall be delivered continuously in covered vehicles and immediately spread and compacted. In cold weather and for exceptionally long hauls, all trucks shall be insulated. All mixes shall be delivered at a temperature of 300° F and shall not vary by more than  $\pm 20^\circ$  F of this specified temperature.

Any new bituminous pavement adjacent to or abutting existing bituminous pavement that is ten years old or newer shall be installed using Infrared Asphalt Restoration technology. Clarification on roads that are ten years old or newer can be obtained from the City Engineer.

C. Concrete Pavement, Sidewalk and Driveways:

Concrete for restoring street pavements, sidewalks and driveways shall attain minimum 28-day strength of 4000 pounds per square inch. Neat edges of patch areas shall be obtained by the use of a concrete saw. Concrete mixing aggregates and curing methods shall conform to the specifications for Concrete Work. Concrete patches shall match the original width and depth and in no case a depth less than four (4") inches for sidewalks and nine (9") inches for streets. Sidewalks shall have contraction joints a distance apart equal to the width of the slab.

D. Concrete Curb and Gutter:

Concrete for restoring curb and gutter shall attain 28-day strength of 4000 pounds per square inch. Neat edges of patch areas shall be obtained by the use of a concrete saw. Concrete mixing aggregates and curing methods shall conform to the Specifications for Concrete Work. Replacement of curb and gutter shall match as near as possible to the existing curb, and/or as directed by the Engineer.

3. GRAVEL ROADS, DRIVEWAYS AND SHOULDERS:

All gravel roads shall be restored in accordance with 2012 MDOT Standard Specification Section 306 using eight (8") inches of MDOT 22A gravel. Shoulders shall be restored to their original width and depth in accordance with 2012 MDOT Standard Specifications Section 307 using MDOT 23A gravel. Shoulders shall be raised on both sides of the pavement to match new pavement surfaces.

4. TOPSOIL, SEED AND MULCH:

A. Grass Areas:

Unless otherwise shown on plans, all grassed areas disturbed during construction shall be restored with placing a four (4") inch layer of topsoil. If existing sod can be stripped and replaced in an acceptable manner, it can be reused. Topsoil, seed, mulch and fertilizer shall be placed in accordance with §816 of the MDOT 2012 Standard Specifications for Construction. Seeding is to be a Class A mix applied at a rate of 200 pounds per acre. Fertilizer shall be a 12-12-12 mix applied at a rate of 240 pounds per acre. The seed mixture shall be sown at the rate specified by using the hydro-seed method, incidental to Class A seed. Seeding shall be floated and lightly compacted to incorporate the seed in the uppermost ½" of the soil. Hydro-mulch shall be applied at a rate of 2 tons per acre after the seeding operation. The Contractor shall provide watering of seeded areas as necessary to ensure germination and growth for a period of thirty (30) days following planting. All watering operations shall be incidental to topsoil, seed and mulch.

B. Lawn Areas:

Unless otherwise indicated on the plans, all lawn areas that have been disturbed during construction shall be restored with placing a four (4") inch layer of screened topsoil. The Contractor shall till; fine grade; hand rake to remove all sticks, stones, debris, clay lumps, sod clods and other undesirable materials in the top four (4") inches of soil and have the Engineer approve the seed bed before seeding. After the seedbed has been prepared and approved, the Contractor shall sow the specified seed mixture with a mechanical seeder. The Contractor shall then lightly hand rake the seed mixture into the soil to ensure good seed-to-soil contact. Do not cover seed deeper than 1/8 inch. Up to 20% of the seed may remain on the surface. The lawn area will then be compacted using a weighted lawn roller. Grass seed shall be applied at the rate of six pounds (6#) per thousand square feet in the following mixture.

| <u>SEED</u>                   | <u>PERCENT/WEIGHT</u> | <u>PERCENT/GERMINATION</u> |
|-------------------------------|-----------------------|----------------------------|
| Kentucky Bluegrass            | 30%                   | 85%                        |
| Riviera Perennial<br>Ryegrass | 40%                   | 85%                        |
| Creeping Red Fescue           | 30%                   | 85%                        |

After the seed is installed the entire seedbed area shall be hydro-mulched as specified below. The Contractor shall incorporate a 6-24-24 plant food fertilizer (follow bag instructions) in the top two (2") inches of soil at the time of tilling and prior to seeding or in the hydro-slurry mix at a rate of three hundred pounds per acre (300#/acre). Mulch for hydro-mulching shall be commercially available wood cellulose fiber or wood pulp for use in spray applicators and shall be applied at a rate of 1,250 pounds per acre. All seed areas must be completely and uniformly covered. Light and uneven areas will not be accepted. The Contractor shall maintain all seeded lawn areas for a period of sixty (60) days following mulching.

The Contractor shall be responsible for watering of seeded lawn areas on a regular basis throughout the maintenance period and shall adjust watering to include natural rainfall if ½ inch or more falls in a two (2) consecutive day period.

All lawn areas shall receive at least 1-½ inches of water per week in porous soils and one (1") inch of water in clay soils. One (1") inch of water is approximately 640 gallons of water per 1,000 square feet of lawn area. Water new seeding frequently to keep soil evenly moist. Water every day until seedlings are 2"-3" tall. If weather is hot and dry, Contractor shall water more than once a day.

The Contractor shall furnish and/or arrange for with the Owner, all equipment and materials necessary to properly conduct all watering operations in a timely, efficient and orderly manner.

All water shall be by spray application at rates that permit continuous absorption without puddling or flowing off-site or into other areas. Flood watering will not be permitted.

5. DITCHES:

Ditches, which have been grassed and maintained by the abutting property owner, shall be restored to their original shape, condition, line and grade. Ditches in which culverts or drain tile have been installed shall have the same tile replaced if in good condition, or shall have tile satisfactory to the Engineer installed in its place at the original line and grade.



6. TREES:

The Contractor shall endeavor to save as many trees as possible. Cut trees, including stumps, shall be disposed of by the Contractor. Tree branches, which become broken shall be removed by cutting off just beyond the outer edge of the branch collar. Unless otherwise noted, trees removed by the Contractor shall be replaced with a reasonably sized tree of the same variety as directed by the Engineer.

Replacement trees of the deciduous or hardwood type shall be furnished from nursery stock, at least 2 to 2.5 inches in diameter, and shall have the roots contained in a ball of soil and wrapped in burlap.

Replacement trees of the evergreen type may be furnished from either nursery or native stock, at least 8-10 feet in height and shall have roots contained in a ball of soil and wrapped in burlap.

All trees shall be properly anchored to avoid damage to the tree and to prevent overturning.

Trees that are designated to be removed shall be removed completely and disposed of off the site. Only those trees designated to be removed shall be removed, with all others being saved.

7. FENCE REPLACEMENT:

Chain Link Fence shall be replaced according to MDOT specifications.

Other Fences shall be replaced equal to and of the same type as existing fences.

Salvaged material, if approved by the Engineer, may be used for replacement.

8. COMMERCIAL SIGNS:

Commercial signs, which must be removed by the Contractor in order for work to proceed, shall be replaced and reconstructed to original condition. It is very important that replacement follow immediately behind the construction work.

9. BUILDINGS SEWERS:

Building sewers shall include any and all parts of private residential, commercial or industrial sewage disposal system such as sewer pipe, septic tanks and drain fields. Whenever the service of any such facility is interrupted because of the Contractor's operations, he shall provide such interim methods of sewage disposal as are required to maintain a safe, nuisance-free, and non-polluting construction operation.

10. OTHER DEBRIS:

Upon completion of the work the Contractor shall, as directed by the Engineer, remove from the vicinity of the work all equipment and all temporary structures, waste materials and rubbish resulting from his operations, leaving the premises in a neat and presentable condition. In the event of his failure to do so, the same may be done by the City at the expense of the Contractor.

11. MEASUREMENT AND PAYMENT:

Unless otherwise noted below, all restoration costs will be incidental to the various types of work delineated in the Contractor's proposal. No extra pay will be allowed for restoration work inside or outside the normal work limits of the proposed construction unless approved in writing by the Engineer or his representatives prior to the work being undertaken. The costs for removal of asphalt, concrete pavements, etc., are incidental to the cost of replacement of the items, unless otherwise indicated in the contract documents.

All unit price items in the proposal will not be considered to be complete until the Engineer has accepted the restoration work. Ten percent (10%) of the contract unit price will be withheld from the periodic pay estimate until the restoration work is accepted.

Payment for replacement and clean-up shall be limited to those items on the proposal and shall be on the basis of the actual quantities constructed to the limits set forth below:

A. Bituminous Pavement and Patching:

Paving and patching asphalt streets and driveways shall be measured within the limits shown on the plans and paid by the square yard, unless otherwise indicated in the contract documents.

B. Concrete Streets, Drives and Sidewalks:

Replacing concrete streets, driveways and sidewalks shall be measured within the limits shown on the plans and paid by the square yard, unless otherwise indicated in the contract documents.

C. Concrete Curb & Gutter:

Replacing concrete curb and gutter shall be measured within the limits shown on the plans and paid by the lineal foot, unless otherwise indicated in the contract documents.

D. Topsoil, Seed and Mulch:

Replacing topsoil, seed and mulch in grass and lawn areas shall be measured within the limits shown on the plans and paid by the square yard, unless otherwise indicated in the contract documents.

CITY OF TRAVERSE CITY

SPECIAL PROVISION  
FOR  
**SIDEWALK, REM**

ARY/CITY OF TRAVERSE CITY

1 of 1

03-08-17

DESCRIPTION

This work shall be done in accordance with the requirements of Section 204 of the MDOT 2012 Standard Specifications for Construction with the following exceptions:

This special provision is for every location and is intended to cover the work needed to remove the sidewalk which includes concrete sidewalk, composite pavement sidewalk, sidewalk w/ snowmelt system, concrete steps regardless of thickness.

CONSTRUCTION METHODS

This work shall be done in accordance with the requirements of Section 204.03 of the MDOT 2012 Standard Specifications for Construction.

The Contractor shall provide neat and clean sawcuts at the limits of sidewalk removal where existing sidewalk is to remain. Limits of sidewalk remove will be field staked by the Engineer. Additional sawcuts not shown on plan may be required. Contractor responsible for providing sidewalk remove adjacent to structures where sawcuts are not possible. Contractor shall protect existing sidewalk and structures to remain from damage during construction. If existing sidewalk is damaged during construction additional sawcuts may be required as determined by the Engineer at no additional cost to the project.

MEASUREMENT and PAYMENT

The complete work as measured for Sidewalk, Remove will be measured as shown on the plans for the various locations this pay item is in use, and will be paid for at the contract unit price per square yard and includes all material, equipment and labor to complete this item for areas shown on the plans and as indicated in the field.

PAY ITEM

PAY UNIT

SIDEWALK, REM

SYD

CITY OF TRAVERSE CITY  
SPECIAL PROVISION  
FOR  
**IRRIGATION SYSTEM**

City of Traverse City/TJL

1 of 10

3-17-2014

1. **DESCRIPTION:** The work covered by this section of the specifications consists of furnishing all labor, materials and equipment, and in performing all operations for the installation, testing and adjusting of irrigation piping, spray heads and appurtenances in accordance with these specifications and the plans.
  
2. **MATERIALS:**
  - A. Copper Pipe: Copper pipe shall be Type "L" rigid copper pipe with wrought or cast fittings or Type "K" copper pipe which is annealed and soft temper with flared or compression-type joints.
  
  - B. Steel Pipe: Steel pipe and couplings and wrought-iron couplings shall conform to the specifications of ASTM A120, standard weight, galvanized. Fittings, except for couplings, shall be galvanized malleable iron, banded and threaded, conforming to ANSI B16.3, 150-pound class.
  
  - C. Plastic Pipe Sleeve: Plastic pipe for sleeves as noted on the plans shall be class 160 BE polyvinyl chloride (PVC) pipe or as approved by the Engineer.
  
  - D. Plastic Pipe Supply Line: Plastic pipe supply line shall be polyvinyl chloride (PVC) of the types and classifications shown on the plans. Plastic pipe supply line shall be approved by the National Sanitation Foundation and designed for 160 psi pressure. Plastic pipe supply line and fittings that are on the supply side of control valves and are 2 inches or larger in diameter shall be either the rubber ring gasket type or the solvent cemented type, except that all pipe and fittings installed in conduit shall be the solvent cemented type. All other plastic pipe supply lines and fittings shall be the solvent cemented type. Threaded fittings and fittings to be solvent cemented to plastic pipe supply line shall be injection-molded PVC, Schedule 40. Fittings equipped with rubber ring gaskets for supply lines shall be either injection-molded PVC plastic pipe fittings or machined pipestock fittings.  
Solvent cement and primer for PVC plastic pipe and fittings for supply lines shall be of commercial quality specifically manufactured for use with rigid PVC pipe and fittings. The solvent cement and primer used shall be made by the same manufacturer. The color of the primer shall contrast with the color of the pipe and fittings.
  
  - E. Plastic Pipe Irrigation line: Plastic pipe irrigation line shall be polyethylene pipe conforming to the provisions in this section and as shown on the plans. Polyethylene pipe shall be approved by the National Sanitation Foundation and designed for 100 psi pressure. The polyethylene pipe

shall provide leak-free non-separating connections suitable for the purpose intended when connected to the fittings specified herein. Utility grade polyethylene pipe will not be acceptable.

Fittings to be used with polyethylene pipe shall be the compression type or insert type with stainless steel clamps and shall be recommended by the manufacturer of the polyethylene pipe. Fittings shall have an internal barb to provide a positive pipe-to-fitting connection that will not separate at the designed pressure.

- F. Sprinklers: Sprinklers shall be as shown on the plans.
- G. Emitters: Emitters shall be as shown on the plans.
- H. Spray Nozzles: Spray nozzles for nozzle line shall have proper throw to adequately cover the areas to be watered.
- I. Quick Coupling Valves: Quick coupling valves shall be 3/4-inch double-slot type with self-closing cap, unless otherwise shown on the plans. Except for the cap, quick coupling valves shall be of brass or bronze construction.
- J. Control Valves: Control valves shall be the electric remote-control or the manual type, straight or angle pattern globe valves, as shown on the plans and shall be of the same size as the pipeline which said valves serve, unless otherwise shown on the plans. Control valves shall be capable of withstanding a cold-water working pressure of 150 psi.
- K. Valve Boxes: Valve boxes shall be PVC (4 inches minimum diameter) with one-piece covers unless otherwise shown on the drawings.
- L. Backflow Preventers: Backflow preventers shall be approved reduced pressure principle devices. Backflow preventers shall be factory assembled and shall include one pressure differential relief valve, 2 gate valves and 3 test cocks. Backflow preventers, strainers and valves shall be the same size as the pipeline in which they are installed unless otherwise shown on the plans. Backflow preventers shall have a bronze body assembly.
- M. Flexible Hose: Flexible hose for flexible swing-joint assemblies, flexible risers and valve-and-filter assembly units shall be nonrigid polyvinyl chloride (nonrigid PVC) hose conforming to the sprinkler head manufacturer's recommendations.

The hose shall provide leak-free, non-separating connections suitable for the purpose intended when connected to the fittings specified herein. Fittings shall be injection-molded PVC and shall be solvent cemented type or insert type with stainless steel clamps.

- N. Valves: Gate valves shall be either flanged, threaded or ring type, iron or bronze body, bronze trimmed valves with a non-rising stem. Ball valves shall be ¼ turn and have a bronze body. Valves shall withstand a cold-water working pressure of 150 PSI
- O. Unions: Unions shall be brass or malleable iron. All unions shall withstand the working pressure range requirements of the pipes with which they are used.
- P. Wye Strainers: Wye strainers shall have an all-bronze body with a removable No. 20 mesh stainless steel or Monel strainer. Strainers shall be equipped with a hose bib. Strainers shall be capable of withstanding a cold-water working pressure of 150 psi.
- Q. Electrical Equipment and Materials: All electrical equipment and materials shall conform to the State of Michigan Electrical Code, latest edition.
- R. Irrigation Controllers: Irrigation controllers shall conform to the requirements specified herein and as shown on the plans. Battery controllers shall operate on batteries of the type and size recommended by the manufacturer of the controllers. Other controllers shall operate on 120-volt alternating current and shall supply 24- to 30-volt alternating current for operating electric remote-control valves. The controllers shall be housed in pedestal or wall-mounted enclosures as specified in the special provisions or as shown on the plans. The enclosures shall have a door lock for which 2 keys shall be provided.
- S. Conductors: Conductors for operation below 50 volts shall be direct-burial and shall be the underground feeder type identified as (UF) with a minimum thickness of PVC insulation of 56 mils for conductors No. 10 and smaller and 70 mils for conductors No. 8 and larger.
- T. Electric Remote Control Valves: Electric remote control valves shall be of the type specified on the plans.
- U. Location Tape: Standard, 4-Mil polyethylene 76 mm (3 inch) wide tape, non-detectable, type blue with black letters and imprinted with "CAUTION BURIED IRRIGATION WATER LINE BELOW" shall be placed 1 foot above all lines installed using open cut method of installation.
- V. Tracer Wires: No. 14, Green, Type TW plastic-coated copper tracer wire shall be installed with non-metallic irrigation main lines and zone laterals between the control valve and sprinkler heads.
- W. Meter Pit: Shall consist of corrugated polyethylene drainage pipe set on 6 inch bedding layer of 6AA stone with a 2 inch concrete adjusting ring with a 24 inch clear opening, Fralo Star 24P manufactured cover with

stainless steel security seal and lock as shown on the plans. Piping shall be as shown on the plans.

### **3. CONSTRUCTION METHODS:**

- A. Shop Drawings and Layout Plans: Contractor shall provide shop drawings for the proposed irrigation system components and general layout for pipe, control wires and spray heads.
- B. Electrical Installations For Irrigation Systems: Electrical installations for electric automatic irrigation systems shall conform to the State of Michigan Electrical Code.
  - i. Components: Electrical components for electric automatic irrigation systems shall include automatic controllers, master controllers, auxiliary controllers and battery controllers, all with enclosures; remote control valves and master remote control valves; valve boxes; pull boxes; conductors between controllers, pumps and valves; and all appurtenances, incidentals and accessories required for proper installation and operation of the electrical portions of such systems.

All voltages shown on the plans or specified in these specifications for electrical components for electric automatic irrigation systems shall be considered as nominal. Electrical components requiring modifications to conform to the specified requirements shall have such modifications made by the manufacturer before shipment to the project.

- ii. Service: Electric service installations for electric automatic irrigation controllers shall conform to these specifications. Electrical service installation and materials shall conform to the requirements of the serving utility.

Service for electric automatic irrigation controllers shall be 120-volt, single-phase, AC and shall be obtained from the service points shown on the plans. For new service installations, the service disconnects for the electric automatic irrigation controllers shall be installed in a rain-tight enclosure as shown on the plans and shall be complete with insulated ground-able neutral.

Service equipment enclosures shall be galvanized or, at the option of the Contractor, said enclosures may be provided with a factory-applied rust-resistant prime coat and enamel finish coat in lieu of galvanizing.

When an existing service installation is to be used, a single-pole, 120-volt, 20-ampere trip circuit breaker shall be provided in the existing installation for automatic irrigation controllers.



Unless otherwise shown on the plans, service conductors from service disconnect to the electric automatic irrigation controllers shall be installed in a minimum 3/4-inch rigid metallic conduit.

- C. **Controllers:** Controllers, controller enclosures and accessories shall be installed in conformance with the manufacturer's instructions, these specifications and as shown on the plans. The installation date and the expiration date of the guarantee for the controllers shall be permanently marked on the inside face of the controllers. A complete maintenance and operations manual for each type of controller installed shall be submitted to the Engineer. Controllers installed separately from the service enclosure shall be in a weather proof and lockable enclosure.
- D. **Conductors, Electrical Conduit and Pull Boxes:** Conductors shall be of the size recommended by the manufacturer of the controllers to be installed. Each sprinkler zone shall have a common neutral conductor to its respective valves.  
Each remote control valve shall have a separate control conductor with no other valves connected to the conductor. At least 2 feet of slack shall be left for each conductor at each pull box. At each valve box, at least 2 feet of slack shall be left for each conductor that is connected to other facilities within the box or is spliced within the box. Conductors shall be wrapped together with electrical tape at 10-foot intervals.

Except as otherwise provided in this paragraph, conductors shall be buried directly in the ground. Where conductors are surface-mounted or where conductors pass under paved areas, through pipe conduit or through concrete, the conductors shall be installed in electrical conduit. Electrical conduit shall be rigid nonmetallic conduit, except that surface-mounted conduit shall be rigid metallic.

Where conductors are installed in the same trench or opening as the pipe, the conductors shall be placed at the same depth as the pipe. At other locations, the conductors shall be installed not less than 12 inches below the ground surface.

The Contractor, at this option, may install conductors for an irrigation system by methods and with equipment other than by trenching, provided the conductors are installed at the depths specified and the conductor insulation is not damaged by the methods and equipment used.

The tops of pull boxes installed in walkway and paved areas shall be flush with the surrounding grade. Splices shall be made only in pull boxes or valve boxes.

Conductors in controller cabinets shall not be spliced. Temporary splices used for testing valve circuits shall not be used as permanent splices. All permanent splice connections shall be made with freshly cut and skinned conductors.

- E. Installation: Irrigation systems shall be installed in accordance with the manufacturer's recommendations and these specifications. The irrigation systems as shown on the plans, except for sprinkler locations, are diagrammatic.
- i. Components: All underground metallic pipes, valves or fittings made of dissimilar metals shall be connected through a dielectric coupling or bushing. Pipe installed in this manner shall be physically separated from other metal objects. The risers for sprinklers on slopes shall be set approximately perpendicular to the plane of the slope.

If the location of a supply line interferes with the drilling of the plant holes, the plant holes shall be located as to clear the supply lines. Supply lines shall not be installed through plant holes unless otherwise shown on the plans. Valves shall be installed 5 feet from curbs, dikes, sidewalks and paved shoulders and 3 feet from fences and walls unless otherwise shown on the plans or specified in the special provisions.

Foreign material shall be prevented from entering the irrigation system during installation. Immediately prior to assembling, all pipes, valves and fittings shall be cleaned. All unattached ends of pipe, fittings and valves shall be plugged or capped pending attachment of additional pipe or fittings. All lines shall be thoroughly flushed out prior to attachment of sprinklers, emitters and other terminal fittings.

- ii. Conduit for Water Line Crossovers and Sprinkler Control Crossovers:

The installation of conduit for water line crossovers and sprinkler control crossovers shall conform to the provisions in this section. Conduit shall be installed not less than 1.5 feet below curb grade in sidewalk areas and not less than 2.5 feet below finished grade in all other areas. Conduits shall extend 2 feet beyond all paving unless otherwise shown on the plans.

Conduit shall be installed under pavement by jacking or drilling. Pavement shall not be disturbed without approval of the Engineer. Jacking or drilling pits shall be kept at least 2 feet from pavement edge wherever possible. Excessive use of water that will soften subgrade or undermine pavement will not be permitted.

Where conduit is installed in an open trench, the bottom of the trench shall be graded and prepared to provide a firm and uniform bearing throughout the entire length of the conduit. During backfilling operations, the conduit shall be rigidly supported so that no movement of or damage to the conduit or joints will result.

iii. Water Line Crossovers:

Water line crossovers shall be any supply line pipe that is installed in a conduit under a roadway or other facility. The work of installing water line crossovers shall include furnishing and installing appurtenances as shown on the plans or specified in these specifications. Water line crossovers shall be PVC plastic pipe of the sizes and pressure rating shown on the plans or specified herein.

After completing conduit backfill, the Contractor shall demonstrate that the water line crossover can be moved longitudinally within the conduit. The water line crossover shall then be positioned to extend at least 1 foot beyond each end of the conduit. Where water line crossovers are not to be connected to other supply lines, the ends of such crossovers shall be capped.

iv. Trenching and Backfilling:

Rocks and other debris encountered during trenching operations shall be brought to the surface of the ground, removed and disposed of by the Contractor. Trenches for plastic pipe shall be of sufficient width to permit snaking of all plastic pipe not connected by rubber ring-type fittings. Trenches for plastic pipe shall be smooth and free of jagged rubble or sharp objects which will cause abrupt bending stresses and uneven weight distribution during backfilling operations.

Backfilling of pipe trenches shall be accomplished in a manner that will protect the pipe from damage from sharp objects. Rocks shall not be placed directly on the pipe. Except as otherwise specified in this section, backfill material shall be compacted by ponding or jetting with water until the backfill material, after settlement, is level with the surrounding soil. When any backfilled area has settled, said area shall be refilled and compacted by the Contractor at his expense, including furnishing, placing and compacting the fill material.

Where supply lines or conduits are installed through existing paved areas, the sub-base, base and paving removed shall be replaced with material of equal quality.

v. Pipe:

The Contractor, at his option, may install plastic pipe supply line with solvent cemented fittings and plastic pipe irrigation line for an irrigation system by methods and with equipment other than by trenching, provided the pipes are installed at the depths specified. Where connection is made to existing supply lines, compression-type fittings may be used. Pipe between water meters and plastic pipe supply line through a backflow

preventer assembly shall be galvanized steel or as otherwise shown on the plans.

Unless otherwise approved by the Engineer, supply line trenches located adjacent to curbs, dikes and paved shoulders shall be at least 4 feet from said curbs, dikes and paved shoulders. Plastic pipe supply line, plastic pipe irrigation line and fittings shall be installed according to the pipe and fitting manufacturer's printed instructions and as directed by the Engineer.

All pipe shall be cut straight and true. After cutting, the ends shall be reamed out to the full inside diameter of the pipe. Male pipe threads on galvanized steel pipe shall be coated with a joint compound that is non-hardening and noncorrosive. Solvent cement welding shall be done in accordance with the printed instructions of the solvent cement manufacturer.

vi. Valves and Valve Boxes:

Valve boxes with extensions, if required, shall be provided for housing control valves. The tops of valve boxes shall be flush with the surrounding grade.

F. Testing: Field tests and a functional test shall be performed by the Contractor to demonstrate that all parts of each irrigation system function as specified.

Field tests shall be performed on all conductors. Where the conductors are installed by trenching and backfilling, such tests shall be performed after at least 6 inches of backfill material has been placed over the conductors and said material has been compacted.

The functional test for each electric automatic controller and associated automatic irrigation system served by a single electric service point, or a group of electric automatic controllers and associated automatic irrigation systems served by a single electric service point, shall consist of not less than 15 consecutive working days of operation during which time each controller shall execute at least three (3) complete cycles automatically for each station controlled by the controller. The lengths and frequencies of the cycles will be determined by the Engineer. If unsatisfactory performance of any system develops, the condition shall be corrected and the test repeated until 15 working days of continuous satisfactory operation is obtained.

G. Pressure Testing: Pressure testing for leakage shall be performed on all pipelines installed by the Contractor, except for nonrigid pipelines and pipelines with spray nozzles installed into the pipe. Pipelines to be tested shall be installed, and all open ends of the pipeline and fittings shall be plugged or capped prior to testing. Pressure tests shall be performed in one or more operations. Pipelines installed by trenching and backfilling

and pipelines which are completely visible after installation shall be tested by either Method A or Method B as specified below. The method used will be at the Contractor's option. Water line crossovers that are connected to other pipelines to be tested shall be tested in the same manner as the pipelines to which they are connected.

**Method A:** Method A pressure testing procedure for leakage shall conform to the following:

The Contractor shall notify the Engineer at least 24 hours prior to performing any pressure test. Pressure tests shall be performed only between the hours of 8:00 a.m. and 5:00 p.m. except that no pressure tests shall be made on Saturdays, Sundays or legal holidays, unless otherwise approved in writing by the Engineer. Each pressure test shall be observed by the Engineer.

Pipelines to be tested shall be filled with water, and a pressure gauge shall be connected to the pipeline. The pipeline shall then be placed under a pressure of 75 pounds psi, except as otherwise specified below, by air or water pressure, after which the source of pressure shall be cut off leaving the line under the required pressure.

The pressure gauge shall be calibrated from 0 - 150 psi in 5-pound increments and shall be accurate within a tolerance of 2 pounds.

The pipeline shall be tested under the required pressure for a period of one hour. The pressure gauge shall remain in place until each test period has been completed. All leaks that develop in the portion of the system installed by the Contractor shall be located and repaired after each test period when a drop of more than 5 pounds is indicated by the pressure gauge. After such leaks have been repaired, the one-hour pressure test shall be repeated and any necessary additional repairs made until the drop in pressure is 5 psi or less.

When a system consists of new pipelines installed by the Contractor and existing pipelines, the testing pressure shall be the pressure of the water source to which the system is to be connected, as measured at the point of the connection, in lieu of the 75 pounds psi specified above. If any such system fails the specified pressure test, the new pipelines shall be isolated from the existing pipelines at the Contractor's expense, and the new pipelines shall be tested separately at 75 psi in accordance with these specifications.

**Method B:** Method B pressure testing procedure for leakage shall conform to the following:

The Contractor shall notify the Engineer at least 24 hours prior to performing any pressure test. Pressure tests shall be so performed that the testing periods end between the hours of 8:00 a.m. and 5:00 p.m.

except that no pressure test period shall end on Saturdays, Sundays or legal holidays, unless otherwise approved in writing by the Engineer. Each pressure test shall be observed by the Engineer.

Before any portion of the pipeline on the supply side of a control valve is backfilled, water shall be turned into that portion of the line and maintained at full pressure from the water source for a period of not less than 8 consecutive hours after all air has been expelled from the line. Before any portion of the pipeline on the discharge side of a control valve is backfilled, a similar test shall be performed, except the test shall be for a duration of one hour. Any leaks that develop in the portion of the system installed by the Contractor shall be repaired. After such leaks have been repaired, the pressure test shall be repeated and any additional necessary repairs made until no leaks occur as determined by the Engineer.

- H. Repairs and Coverage: All leaks that develop and all defective material in any portion of the irrigation system installed by the Contractor shall be repaired or replaced by him. The entire system shall be checked and, if necessary, adjusted for uniform and complete coverage after installing the sprinklers. All emitters shall be checked for proper operation and, if necessary, cleaned or replaced.
- I. As-Built Drawings and Instruction Manuals: Prior to payment for irrigation system work, the Contractor shall furnish the Engineer a complete "as-built drawing" of the entire irrigation system showing accurate locations and dimensions of all piping, sprinkler heads, valves, etc. Drawings shall include the manufacturer's name and model number of all equipment installed. Drawings shall be on reproducible Mylar. Contractor shall also furnish the Engineer with two (2) copies of instruction manuals and/or service manuals or parts list for controllers, control valves and sprinkler heads.

#### **4. MEASUREMENT AND PAYMENT**

The complete work as measured for the items below will be paid for at the contract unit price for the following contract pay items and includes all materials, equipment and labor to complete all work including but not limited to meter pit, backflow preventers, sleeves, controllers, enclosures, electrical wiring and connectors, piping and sprinkler systems, tracer wire for all piping and other necessary items of work as required for the complete irrigation system installation and as detailed on the plans and directed by the Engineer.

| PAY ITEM          | PAY UNIT |
|-------------------|----------|
| Irrigation System | Lump Sum |

## APPENDIX A [TO APPLY TO ALL FEDERAL-AID CONTRACTS]

During the performance of this contract, the contractor, for itself, its assignees and successors, in interest (hereinafter referred to as the “contractor”) agrees, as follows:

1. **Compliance with Regulations:** The contractor shall comply with Regulations relative to nondiscrimination in Federally-assisted programs of the Department of Transportation, Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this contract.
2. **Nondiscrimination:** The contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, sex, or national origin in the selection, retention, and treatment of subcontractors, including procurements of materials in the discrimination prohibited by Section 21.5 of the Regulation, including employment practices when the contractor covers a program set for in Appendix B of the Regulations.
3. **Solicitation for Subcontracts, Including Procurements of Materials and Equipment:** In all solicitations either by competitive bidding or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor’s obligations under the contract and the Regulations relative to nondiscrimination on the grounds of race, color, or national origin.
4. **Information and Reports:** The contractor shall provide all information and reports required by the Regulations, or directives issues pursuant thereto, and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the State Highway Department of the Federal Highway Administration to be pertinent to ascertain compliance with such Regulations or directives. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information, the contractor shall so certify to the State Highway Department or the Federal Highway Administration, as appropriate, and shall set forth what efforts it has made to obtain the information.
5. **Sanctions for Noncompliance:** In the event the contractor’s noncompliance with the nondiscrimination provisions of this contract, the State Highway Department shall impose such contract sanctions as it or the Federal Highway Administration may determine to be appropriate, including, but not limited to:
  - a. Withholding payments to the contractor under the contract until the contractor complies and/or

- b. Cancellation, termination or suspension of the contract, in whole or in part.
6. **Incorporation of Provisions:** The contractor shall include provisions of paragraphs (1) through (6) in every subcontract, including procurement of material and leases of equipment, unless exempt by the Regulations, or directives issued pursuant thereto. The contractor shall take such action with respect to any subcontract or procurement as the State Highway Department or the Federal Highway Administration may direct as a means of enforcing such provisions including sanctions for noncompliance: provided, however, that, in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the contractor may request the State Highway Department to enter into such litigation to protect the interests of the State, and, in addition, the contractor may request the United States to enter into such litigation to protect the interests of the United States.