

CITY OF PORT HURON, MICHIGAN
CONTRACT DOCUMENTS
FOR

FIRE STATION NO. 4
BUILDING IMPROVEMENTS

PROJECT NO. P26-0010



FIRE STATION NO. 4 BUILDING IMPROVEMENTS
PROJECT NO. P26-0010

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ADVERTISEMENT FOR BIDS
CITY OF PORT HURON, MICHIGAN

PROJECT NO. P26-0010

Sealed bids will be received by the City of Port Huron, Michigan, by mail or in person in the office of the City Clerk, 1st Floor, 100 McMorran Boulevard, Port Huron, Michigan 48060 until 3:00 p.m. on April 22, 2026, and immediately thereafter the bids will be publicly opened and read in the Room 101 of the aforesaid Municipal Office Center.

JOB DESCRIPTION:

The Work consists of furnishing all labor, material, and equipment required for exterior and interior building improvements as shown on the Drawings or specified in the Project Manual.

Bidding documents including drawings and project manual contract documents, including instruction to bidders form, agreement and specifications may be examined and shall be obtained from the Michigan Inter-governmental Trade Network (MITN) website by BidNet Connect, Located at <https://www.bidnetdirect.com/mitn> beginning on Friday, March 27, 2026. All Bidders shall obtain a complete set of bid documents, including all posted addenda, from the City of Port Huron via MITN.

A mandatory pre-bid meeting will take place at Fire Station No. 4, 3114 24th Street, Port Huron, Michigan on April 10, 2026 at 2 pm.

A certified check payable to the City of Port Huron, or a satisfactory bid bond executed by the bidder and a surety company, in the amount equal to five percent (5%) of the bid, shall be submitted with each bid. No bid may be withdrawn for at least ninety (90) days after the scheduled closing time for receiving bids. All bids must be submitted on proposal forms provided by the City of Port Huron for that purpose.

The City of Port Huron reserves the right to reject any or all bids, to waive any defects or irregularities in the bid, and to accept any bid which is deemed most advantageous to the said City's interests. The successful bidder will be required to furnish satisfactory performance, labor and materials bonds, maintenance and guarantee bonds, and insurance certificates.

All bidders are required to qualify according to the bidder qualification regulations for contractors bidding on City of Port Huron contracts as set forth in the instruction to bidders. Contractor must comply with the City of Port Huron Uniform City Income Tax Ordinance. For questions regarding this project, please contact Brent Moore, City Engineering Manager, at (810) 984-9730.

City of Port Huron, Michigan
Eric C. Witter, P. E.
Director of Public Works/City Engineer

PUBLISHED: March, 27, 2026
City of Port Huron website (www.porthuuron.org)
Michigan Inter-governmental Trade Network (MITN) Website

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SECTION 00200 - INSTRUCTION TO BIDDERS

ARTICLE 1 - DEFINED TERMS

- 1.01 Terms used in these Instruction to Bidders will have the meanings indicated in the General Conditions, and Supplementary Conditions. Additional terms used in these Instruction to Bidders have the meanings indicated below which are applicable to both the singular and plural thereof:
- A. *Bidder*: The individual or entity who submits a Bid directly to OWNER.
 - B. *Issuing Office*: The office which is responsible for the Bidding Documents being issued and where the bidding procedures are to be administered.
 - C. *Successful Bidder*: The lowest responsible Bidder submitting a responsive Bid to whom OWNER (on the basis of OWNER's evaluation as hereinafter provided) makes an award.
 - D. The term "Contract Documents" shall include the Title Sheet, Advertisement for Bids, Instruction to Bidders, General Conditions, General Specifications, documents listed in the Table of Contents, Non-Collusion Affidavit, Performance Bond, Labor and Material Bond, Maintenance Bond, Proposal, Contract, Certificates of Workmen's Compensation Insurance and of Public Liability and Property Damage Insurance, Drawings or Plans, Addenda to Drawing or Specifications, and any other documents pertinent to the Contract.
 - E. The terms "OWNER" and "City" as used in these specifications shall be understood to mean the Incorporated City of Port Huron, Michigan, acting through the Mayor and City Council or their duly authorized representatives.
 - F. The term "Contractor" shall mean the person or persons, firm or corporation, signatory to the Contract, who agrees to perform all or any part of the work or to furnish all or any part of the materials as provided in the Contract.
 - G. The term "City Manager" shall be understood to mean the City Manager of the City of Port Huron, Michigan.
 - H. The term "Engineer" shall mean the City Engineer of the City of Port Huron or the Registered and State Licensed Professional engaged by the City to supervise and inspect the work provided for by the Contract and shall include duly authorized employees or representatives of said Engineer.

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ARTICLE 2 - COPIES OF BIDDING DOCUMENTS

- 2.01 Complete sets of the Bidding Documents in the number and for the deposit sum, if any, stated in the Advertisement or Invitation to Bid shall be obtained from the issuing location/website identified in the Advertisement or Invitation to Bid.
- 2.02 Complete sets of Bidding Documents must be used in preparing Bids; ENGINEER assumes no responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 2.03 ENGINEER in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bids for the Work and do not confer a license or grant for any other use.

ARTICLE 3 - QUALIFICATIONS OF BIDDERS

- 3.01 To demonstrate qualifications to perform the Work, each Bidder must be prepared to submit within five days after Bid opening, at the ENGINEER's request, detailed written evidence such as financial data, previous experience, present commitments, and other such data as may be called for in paragraph 3.02. Each Bid must contain evidence of Bidders qualification to do business in the state where the Project is located or covenant to obtain such qualification prior to award of the Contract.
- 3.02 Each Bidder and each subcontractor whose Bid is more than Five Thousand Dollars (\$5,000) shall be prepared to submit to ENGINEER the Statement of Bidder's Qualifications.
 - A. Bidder's failing to submit the Statement of Bidders Qualifications and all Bidder's who fail to qualify will be rejected.
- 3.03 All Bidders shall obtain a complete set of bid documents from the location/website identified in the Advertisement or Invitation to Bid issued by the City of Port Huron and appear as a planholder for the project.

ARTICLE 4 - EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND SITE

- 4.01 It is the responsibility of each Bidder before submitting a Bid:
 - A. To examine and carefully study the Bidding Documents, including any Addenda and other related data identified in the Bidding Documents (including "technical data" referred to in Paragraph 4.02 through 4.05, inclusive);

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- B. To visit the site and become familiar with and satisfy Bidder as to the general, local, and site conditions that may affect cost, progress and performance of the Work;
- C. To become familiar with and satisfy Bidder as to all Federal, State, and Local Laws, Ordinances and Regulations that may affect cost, progress, and performance of the Work;
- D. To promptly notify ENGINEER of all conflicts, errors, ambiguities, or discrepancies which Bidder has discovered in or between the Contract Documents and such other related documents;
- E. To carefully study all reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified.
- F. To obtain and carefully study (or assume responsibility for doing so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including any specific means, methods, techniques, sequences and procedures of construction expressly required by the Bidding Documents, and safety precautions and programs incident thereto;
- G. To agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times and in accordance with the other terms and conditions of the Bidding Documents;
- H. To correlate the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies and data with the Bidding Documents; and
- I. To determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work;

4.02 Subsurface and Physical Conditions

- A. The Supplementary Conditions identify:

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1. Those reports of explorations and tests of subsurface conditions at or contiguous to the Site that ENGINEER has used in preparing the Bidding Documents.
 2. Those drawings of physical conditions in or relating to existing surface and subsurface structures at or contiguous to the Site (except Underground Facilities) that ENGINEER has used in preparing the Bidding Documents.
- B. Copies of reports and drawings referenced, if any, in paragraph 4.02.A will be made available by ENGINEER to any Bidder on request. Those reports and drawings are not part of the Contract Documents. Bidder is responsible for any interpretation of conclusion Bidder draws from any “technical data” or any other data, interpretations, opinions or information contained in such reports or shown or indicated in such drawings.
- 4.03 Underground Facilities
- A. Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site is based upon information and data furnished to the ENGINEER by owners of such Underground Facilities, including OWNER.
- 4.04 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated conditions appear in the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work appear in the General Conditions.
- 4.05 On request, ENGINEER will provide Bidder access to the site to conduct such examinations, investigations, explorations, tests, and studies as Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and clean up and restore the site to its former condition upon completion of such explorations, investigations, tests, and studies.
- 4.06 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Bidding Documents and applying any specific means, methods, techniques, sequences, and procedures of construction that may be shown or indicated or expressly required by the Bidding Documents, that Bidder has given ENGINEER written notice of all the written

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resolutions thereof by ENGINEER are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

ARTICLE 5 - SITE AND OTHER AREAS

- 5.01 The site is identified in the Bidding Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by CONTRACTOR. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by OWNER unless otherwise provided in the Bidding Documents.

ARTICLE 6 - INTERPRETATIONS AND ADDENDA

- 6.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to ENGINEER in writing. Interpretations or clarifications considered necessary by ENGINEER in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by ENGINEER as having received the Bidding Documents. Questions received less than ten days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
- 6.02 Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by OWNER or ENGINEER.

ARTICLE 7 - BID SECURITY

- 7.01 A bid must be accompanied by Bid security made payable to OWNER in an amount of five percent of Bidders maximum Bid price and in the form of a Bid Bond issued by a surety meeting the requirements of the General Conditions.
- 7.02 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Contract Documents, furnished the required contract security and met the other conditions of the Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 10 days after the Notice of Award, OWNER may annul the Notice of Award and the Bid security of that Bidder will be forfeited. The Bid security of other Bidders whom OWNER believes to have a reasonable chance of receiving the award may be retained by OWNER until the earlier of seven days after the Effective Date of the Agreements or 91 days after the Bid opening, whereupon Bid security furnished by such Bidders will be returned.

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- 7.03 Bid security of other Bidders whom OWNER believes do not have a reasonable chance of receiving the award will be returned within seven days after the Bid opening.

ARTICLE 8 - CONTRACT TIMES

- 8.01 The number of days within which, or the dates by which, the Work is to be (a) Substantially Completed if any are included in the Bid Documents (b) Milestones (if any are included in the Bid Documents), and (c) completed and ready for final payment as set forth in the contract.

ARTICLE 9 - LIQUIDATED DAMAGES

- 9.01 Provisions for liquidated damages, if any, are set forth in the Agreement.

ARTICLE 10 - SUBSTITUTE AND "OR-EQUAL" ITEMS

- 10.01 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration of possible substitute or "or-equal" items. Whenever it is specified or described in the Bidding Documents that a substitute or "or-equal" item of material or equipment may be furnished or used by CONTRACTOR if acceptable to ENGINEER, application for such acceptance will not be considered by ENGINEER until after the Effective Date of the Agreement. The procedures for submission of any such application by CONTRACTOR and consideration by ENGINEER is set forth in the General Conditions.

ARTICLE 11 - SUBCONTRACTORS, SUPPLIERS, AND OTHERS

- 11.01 If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, individuals, or entities to be submitted to OWNER in advance of a specified date prior to the Effective Date of the Agreement, the apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to ENGINEER a list of all Subcontractors, Suppliers, individuals or entities proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, individual, or entity if requested by ENGINEER. If ENGINEER, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, ENGINEER may, before the Notice of Award is given, request apparent Successful Bidder to submit a substitute, in which case apparent Successful Bidder shall submit an acceptable substitute. Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and ENGINEER may consider such price adjustment in evaluating Bids and making the contract award.

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- 11.02 If apparent Successful Bidder declines to make any such substitution, OWNER may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, individuals, or entities. Declining to make requested substitutions will not constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which OWNER or ENGINEER makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to OWNER and ENGINEER subject to revocation of such acceptance after the Effective Date of the Agreement.
- 11.03 CONTRACTOR shall not be required to employ any Subcontractor, Supplier, individual or entity against whom CONTRACTOR has reasonable objection.
- 11.04 Subcontractors or suppliers whose work exceeds five thousand dollars (\$5,000) shall be required to submit the Statement of Bidder's Qualifications.

ARTICLE 12 - PREPARATION OF BID

- 12.01 The Bid Form is included with the Bidding Documents which shall only be obtained from the location/website identified in the Advertisement or Invitation to Bid
- 12.02 All blanks on the Bid form shall be completed by printing in black ink or typewritten and the Bid signed. Changes on the Bid Form shall be line-out with Bidder's initials next to the change to signify and validate change in Bid Form.
- 12.03 A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown below the signature.
- 12.04 A Bid by a partnership will be executed in the partnership name and signed by a partner (whose title must appear under the signature), as accompanied by evidence of authority to sign. The official address of the partnership shall be shown below the signature.
- 12.05 A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown below the signature.
- 12.06 A Bid by an individual shall show the Bidder's name and official address.
- 12.07 A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture must be shown below the signature.
- 12.08 Evidence of authority to conduct business as an out-of-state corporation in the state where

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the Work is to be performed shall be provided in accordance with paragraph 3 above. State contractor license number, if any, must be shown.

12.09 All names shall be typed or printed in blue or black ink below the signatures.

12.10 The Bid shall contain an acknowledgment of receipt of all Addenda, the number of which shall be filled in on the Bid form.

12.11 The address and telephone numbers including fax, e-mail and cell phones for communications regarding the Bid shall be shown.

12.12. The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located or covenant to obtain such qualification prior to award of the Contract. Bidder's state contractor license number for the state of the Project, if any, shall also be shown on the Bid Form.

ARTICLE 13 - BASIS OF BID; EVALUATION OF BIDS

13.01 Unit Price type bid:

A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the Bid schedule. Bidder shall place the unit price bid for the item under column noted as "Unit Price". Said unit price will be price as bid for all the items in all areas. Quantity per area is broken down for Contractor convenience. Individual items shall not be bid per individual area except as noted on the Unit Price Table.

B. The total of all estimated prices will be determined as the sum of the products of the estimated quantity of each item and the unit price Bid for the item. The final quantities and Contract Price will be determined in accordance with the General Conditions.

C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices.

13.02 Lump Sum type bid:

A. Bidders shall submit a bid on a Lump Sum basis for the Base Bid and include a separate price for each Lump Sum Alternate (if any) as described in the Bidding Documents and as provided for on the Bid Form. The price for each Lump Sum Alternate will be the amount added on to or deleted from the Base Bid if the OWNER selects the Lump Sum Alternate.

B. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between

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words and figures will be resolved in favor of the words.

ARTICLE 14 - SUBMITTAL OF BID

14.01 Each prospective Bidder is responsible for obtaining the Bidding Documents. The Bid Form is to be completed and submitted with the Bid security and the following data:

- A. Required Bid security in the form of a Bid Bond.
- B. A tabulation of Subcontractors, Suppliers and other individuals and entities required to be identified in this Bid;
- C. Non-Collusion Affidavit; and
- D. A Bid shall be submitted no later than the date and time prescribed and at the place indicated in the Advertisement or Invitation to Bid and shall be enclosed in an opaque sealed envelope plainly marked with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, the date and time the bid is to be opened and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate envelope plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid shall be addressed to the OWNER's office. An emailed bid (project specific accepted only), shall include "BID ENCLOSED", the project number, if applicable, and the project name on the subject line. If submitting a bid via email is an option for a project, this option will be stated in the advertisement for bids.

ARTICLE 15 - MODIFICATION AND WITHDRAWAL OF BID

15.01 A Bid may be modified or withdrawn by an appropriate document duly executed in the manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids.

15.02 No Bidder may withdraw any Bid after the Bid Opening time stated in the Advertisement or Invitation to Bid.

ARTICLE 16 - OPENING OF BIDS

16.01 Bids will be opened at the time and place indicated in the Advertisement of Invitation to Bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

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- 16.02 The City of Port Huron will only open Bids from entities that have obtained plans from the location/website identified in the Advertisement or Invitation to Bid for the project.

ARTICLE 17 - BIDS TO REMAIN SUBJECT TO ACCEPTANCE

- 17.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but OWNER may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 18 - AWARD OF CONTRACT

- 18.01 ENGINEER reserves the right to reject any or all Bids, including without limitation, nonconforming, non-responsive, unbalance, or conditional Bids. ENGINEER further reserves the right to reject the Bid of any Bidder whom if finds, after reasonable inquiry and evaluation, to be non-responsible. ENGINEER may also reject the Bid of any Bidder if ENGINEER believes that it would not be in the best interest of the Project to make an award to that Bidder. ENGINEER also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder.
- 18.02 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable ground for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.
- 18.03 In evaluating Bids, ENGINEER will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.
- 18.04 In evaluating Bidders, ENGINEER will consider the qualifications of Bidders and may consider the qualifications and experiences of Subcontractors, Suppliers, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers and other individuals or entities must be submitted as provided in the Supplementary Conditions or Section 00450.
- 18.05 ENGINEER may conduct such investigations as ENGINEER deems necessary to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals or entities to perform the Work in accordance with the Contract Documents.
- 18.06 If the Contract is to be awarded, OWNER will award the Contract to the Bidder whose Bid is in the best interests of the Project.

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ARTICLE 19 - INSURANCE REQUIREMENTS

19.01 The successful Bidder will be required to furnish the following types of insurance coverage in the amounts stated and subject to the conditions stated in the General Conditions or as amended in the Supplementary General Conditions:

- A. Workman's Compensation
- B. Public Liability and Property Damage
- C. Comprehensive General Liability
- D. Automobile Liability
- E. Excess (Umbrella) Liability
- F. Owner's Protective Liability
- G. Property Insurance (if applicable)
- H. Pollution Liability Insurance (if applicable)

Insurance certificates shall be furnished to the City in accordance with these requirements prior to entering into a Contract.

ARTICLE 20 - BOND REQUIREMENTS

20.01 Unless stated otherwise in the Supplementary General Condition, the successful Bidder shall furnish at his own expense three (3) Surety Company bonds, as follows:

- A. A bond to be known as a Performance Bond in a sum equal to the full amount of the Contract running to the City of Port Huron, to insure the construction and completion of the entire work according to the Contract Documents and in the time specified.
- B. A bond to be known as the Labor and Material Bond in a sum equal to the full amount of the Contract, running to the People of the City of Port Huron, for the protection of subcontractors, labor, and suppliers of material and equipment, in accordance with the statutes of the State of Michigan and the City of Port Huron which may be in effect as of the date of said bond.
- C. A bond to be known as the Maintenance Bond in a sum equal to the full amount of the Contract, running to the People of the City of Port Huron, for the protection of subcontractors, labor, and suppliers of material and equipment, in accordance with the statutes of the State of Michigan and the City of Port Huron which may be in effect as of the date of said bond.
- D. The form and execution of such bonds shall meet the approval of the City.

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- E. The Contractor shall furnish for each set of executed Contract Documents an original Performance Bond and an Original Labor and Material Bond and an Original Maintenance Bond.
- F. Should any surety upon the Contract be deemed unsatisfactory to the City at any time, notice will be given to that effect to the Contractor, and the Contractor shall forthwith substitute new surety or sureties satisfactory to the City and without any cost or expense to the City of Port Huron.

ARTICLE 21- SIGNING OF AGREEMENT

21.01 When ENGINEER gives a Notice of Award to the Successful Bidder, it shall be accompanied by the required number of unsigned counterparts of the Agreement with the other Contract Documents which are identified in the Agreement as attached thereto. Within ten (10) days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to ENGINEER.

Within ten (10) days thereafter, ENGINEER shall deliver one fully signed counterpart to Successful Bidder with a complete set of the Drawings with appropriate identification.

ARTICLE 22 - SALES AND USE TAXES

22.01 Bidder shall pay all State Sales, Use and other Taxes that are lawfully assessed against Bidder on materials and equipment to be incorporated in the Work. Said taxes shall be included in the Contract Price. Refer to General Conditions.

ARTICLE 23 - RETAINAGE

23.01 Provisions concerning CONTRACTOR's retainage are set forth in the Agreement.

END OF SECTION 00200

SECTION 00210 – SUPPLEMENTAL INSTRUCTIONS TO BIDDERS

1. PART 1 – GENERAL

1.1 DESCRIPTION

This section is intended as a supplement to the Instruction to Bidders in the following areas:

- A. Bid Withdraw
- B. Availability of Inspection Videos
- C. Examination of the Project Site
- D. Insurance Requirements

2. PART 2 – APPLICATION

2.1 BID WITHDRAW

No Bid, after being submitted, may be withdrawn for at least Ninety (90) days after the actual opening of the bids, unless otherwise specified by the Proposal.

2.2 AVAILABILITY OF INSPECTION VIDEOS

Inspection videos of sewers to be lined may be viewed at the office of the Engineer at 100 McMorran Blvd., Port Huron, Michigan.

2.3 EXAMINATION OF THE SITE

Bidders are encouraged to visit sewer lining locations prior to submitting their competitive bids.

2.4 INSURANCE REQUIREMENTS

Bidders are required to comply with the City of Port Huron Insurance requirements as call for under Supplementary General Conditions.

END OF SECTION 00210

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
PROJECT NO. P26-0010

SECTION 00310 - PRELIMINARY SCHEDULE

This schedule is provided as a preliminary project schedule and is subject to revision by the Owner.

Project Advertised..... March 27, 2026
Pre-Bid Meeting (MANDATORY) April, 10, 2026 at 2 pm
Question Deadline April 16, 2026
Bid Opening April 22, 2026 at 3 pm
Award of Project..... June 8, 2026
Start of Work.....July 7, 2026
Project Completion October 7, 2026

*Or within ten (10) notice of Notice to Proceed or date agreed upon at the Preconstruction meeting between the Engineer and the Contractor.

END OF SECTION 00310

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
PROJECT NO. P26-0010

PROPOSAL FORM

CITY OF PORT HURON, MICHIGAN
FIRE STATION NO. 4 BUILDING IMPROVEMENTS

PROJECT NO. P26-0010

TO: CITY MANAGER

The undersigned, having familiarized himself with the local conditions affecting the cost of the work with the Contract Documents for the designated job and also, the site of the work, hereby proposes to perform all work therein required to be performed and to provide and furnish all labor, materials, equipment, supervision, bonds, insurance, and all construction itemized below in and for the City of Port Huron, all in accordance with the drawings, specifications and other Contract Documents.

BASE BID:

Base bid includes all work included on the Construction Documents and Specifications. Supplemental Unit Prices for select items in the base bid are requested below.

TOTAL AMOUNT OF BASE BID:

AMOUNT OF BASE BID WRITTEN IN WORDS

(\$ _____) Dollars
AMOUNT OF BASE BID WRITTEN NUMERICALLY

UNIT PRICES

Unit prices include all necessary material, plus cost for delivery, installation, insurance, overhead and profit. Contractor to provide the following unit prices (refer to specifications sections and drawings):

ITEM	AMOUNT	UNIT
1. Pavt, Rem	\$	SY
2. Landscape, Rem	\$	LS
3. Curb and Gutter, Rem	\$	FT

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
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4. Conc Pavt, Nonreinf, 8 inch	\$	SY
5. Aggregate Base, 21AA	\$	TON
6. Hand Patching	\$	TON
7. Concrete Sidewalk, 4 inch	\$	SF
8. Sewer, PVC Sch 40, 6 inch, Tr Det A	\$	FT
9. Sewer, PVC Sch 40, 6 inch, Tr Det B	\$	FT
10. Dr Structure Tap, 6 inch	\$	EA
11. Curb and Gutter, Conc, Det F4	\$	FT
12. Traffic Control and Maintenance, Minor Road	\$	LS
13. Lawn Restoration, Hydroseeding	\$	SY
14. Exterior Roof Sheathing – ¾”	\$	SF
15. Treated wood 2X wood nailer	\$	LF

All unit prices are supplementary to the base bid.

ADDENDA(S)

In the event that Addenda have been received during bidding, covering changes to the drawings and specifications, the bidder shall include the following statement in his Proposal:

Addendum No. _____ Dated: _____

Addendum No. _____ Dated: _____

The undersigned bidder understands that the quantities or work as shown herein are approximate only and are subject to increase or decrease and offers to do the work whether the quantities are increased or decreased at the Bid Price stated in the above schedule.

Contract Payment - Refer to General Conditions.

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
PROJECT NO. P26-0010

THE UNDERSIGNED ALSO AGREES AS FOLLOWS:

1. To begin the work within ten (10) days of the Notice to Proceed or date agreed upon at the Pre-Construction meeting between the Engineer and the Contractor.
2. To complete the work, including cleanup by October 7th, 2026.

Accompanying this proposal is a certified check, or a bid bond in the amount of at least five percent (5%) of the bid, payable to the City of Port Huron, which, it is agreed, will be forfeited as liquidated if in the event this proposal is accepted, the undersigned shall fail to execute the Contract and furnish to the City of Port Huron satisfactory Performance, Labor and Material, and Maintenance Bonds within ten (10) days after the Notification of Contract Award.

In submitting this bid, it is understood that the right is reserved by the City of Port Huron to reject any or all bids and to award the contract as may best serve the interests of the City of Port Huron. IT IS FURTHER AGREED THAT THIS BID MAY NOT BE WITHDRAWN FOR A PERIOD OF NINETY (90) DAYS AFTER THE DATE SET FOR OPENING OF BIDS.

DATE: _____

OFFICIAL ADDRESS OF BIDDER:

TELEPHONE: _____

FAX: _____

EMAIL: _____

FIRM NAME: _____

SIGNED BY: _____

PRINTED NAME: _____

TITLE: _____

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
PROJECT NO. P26-0010

STATEMENT OF BIDDER'S QUALIFICATION

1. OFFICIAL NAME OF BIDDER:	
2. TAX IDENTIFICATION NUMBER:	
3. BUSINESS ADDRESS:	
4. TELEPHONE NUMBER: EMAIL ADDRESS(ES):	FAX NUMBER:
5. TYPE OF ORGANIZATION (Check One): ☐ Proprietorship ☐ Partnership ☐ Corporation	
6. YEAR ORGANIZED OR INCORPORATED:	
7. NAMES OF OFFICERS:	

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
PROJECT NO. P26-0010

8. GENERAL TYPE OF WORK PERFORMED BY YOUR COMPANY:

9. BACKGROUND AND EXPERIENCE OF PRINCIPAL MEMBERS OF YOUR ORGANIZATION:

10. FINANCIAL DATA SUBMITTED (Check one below and attach to this statement):

- ☐ Annual Financial Statement certified by C.P.A.
- ☐ Letter of Credit from banks showing collateral required in extending such line of credit
- ☐ Other document substantiating financial ability to perform this contract (specify type):

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
PROJECT NO. P26-0010

11. MAJOR EQUIPMENT AVAILABLE FOR THIS CONTRACT:

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
PROJECT NO. P26-0010

12. RECENT CONTRACTS COMPLETED:			
TITLE	OWNER	AMOUNT	DATE COMPLETED

13. CONTRACTS IN PROGRESS:		
TITLE	OWNER	AMOUNT COMPLETED

FIRE STATION NO. 4 BUILDING IMPROVEMENTS

PROJECT NO. P26-0010

14. HAVE YOU EVER FAILED TO COMPLETE OR DEFAULTED ON ANY CONTRACT AWARDED TO YOUR COMPANY?

☐ NO

☐ YES (if yes, attach detailed statement as to where and why).

15. WILL YOU, UPON REQUEST, FILL OUT A DETAILED FINANCIAL STATEMENT AND FURNISH ANY OTHER INFORMATION THAT MAY BE REQUIRED BY THE CITY OF PORT HURON?

☐ NO

☐ YES

16. DOES ANY MEMBER OF THE BIDDER'S BUSINESS, OR EMPLOYEE THEREOF, SERVE IN ANY OFFICIAL CAPACITY, APPOINTED OR ELECTED, FOR THE CITY OF PORT HURON?

☐ NO

☐ YES (if the answer is yes, list names of such member/employee)

17. THE UNDERSIGNED HEREBY AUTHORIZES AND REQUESTS ANY PERSON, FIRM OR CORPORATION TO FURNISH ANY INFORMATION REQUESTED BY THE CITY IN VERIFICATION OF THE RECITALS COMPRISING THIS STATEMENT OF BIDDER'S QUALIFICATIONS.

SIGNED BY: _____

PRINTED NAME: _____

TITLE: _____

DATE: _____

Subscribed and sworn to before me this ____ day of _____, 20__.

A Notary Public in and for said County.

My commission expires:

County: Notary Public

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
PROJECT NO. P26-0010

NON-COLLUSION AFFIDAVIT

STATE OF MICHIGAN)
) §.
COUNTY OF ST. CLAIR)

_____, being duly sworn, deposes

and says: that he is _____
(State official - capacity in firm)

the party making the foregoing proposal or bid, that bid is genuine and not collusion or sham;
that said bidder has not colluded, conspired, connived, or agreed directly or indirectly with any
bidder or person, to put in a sham bid or to refrain from bidding, and has not in any manner,
directly or indirectly, sought by agreement or collusion, or communication or conference, with
any person, to fix the bid price or affiant of any other bidder, or to fix any overhead, profit or
cost element of said bid price or that of any other bidder, or to secure any advantage against the
CITY OF PORT HURON, or any person interested in the proposed contract; and that all
statements contained in said proposal or bid are true.

(Signature of person submitting bid)

Subscribed and sworn to before me this _____ Day of _____, 20____, a Notary
Public in and for said County.

Notary Public

My Commission Expires: _____

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
PROJECT NO. P26-0010

SECTION 00500 - AGREEMENT

THIS AGREEMENT made and entered into this ____ day of _____, 20__ A.D. by and between the Incorporated City of Port Huron, St. Clair County, Michigan, by its Mayor and City Manager, Anita R. Ashford and James R. Freed, respectively, the City and _____ Party of the second part hereafter called CONTRACTOR.

OWNER and CONTRACTOR, in consideration of the mutual covenants hereafter set forth, agree as follows:

WHEREAS, the City has awarded to the CONTRACTOR the Agreement for the PORT HURON FIRE STATION NO. 4 BUILDING IMPROVEMENTS, PROJECT NO. P26-0010 in the amount of _____ (\$ _____) Dollars (the "Contract Sum") in the City of Port Huron, Michigan, as per Drawings, Plans and Specifications of such work on file in the office of the City Engineer, and City Clerk of the City of Port Huron, which are hereby declared to be a part of this Agreement, and a copy of which the CONTRACTOR acknowledges to have received (the "Work").

ARTICLE 1 - WORK

1.01 CONTRACTOR shall complete the Work as specified or indicated in the Contract Documents. CONTRACTOR agrees to furnish all the material, labor and equipment required for the performance of the Work and in full conformity to the Drawings, Plans and Specifications thereof.

ARTICLE 2 - THE PROJECT

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

CITY OF PORT HURON, MICHIGAN
FIRE STATION NO. 4
BUILDING IMPROVEMENTS
PROJECT NO. P26-0010

ARTICLE 3 - ENGINEER

3.01 The City Engineer of the City of Port Huron, Michigan, is hereinafter called ENGINEER and who is to act as the Owner's representative, assume all duties and responsibilities, and have the rights and authority assigned to ENGINEER in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 - CONTRACT TIMES

4.01 The CONTRACTOR shall complete said Work, including cleanup, **no later than** October 7, 2026 ("Completion Date"), and upon failure to do so shall pay the City, liquidated damages, in the amount of seven hundred fifty dollars (\$750), for each day and every day that shall

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
PROJECT NO. P26-0010

elapse after such date until the work is actually completed. The parties have agreed the amount of daily liquidated damages set forth in this paragraph are a reasonable pre-estimate of the damages the City will incur in the event the Work is not completed in a timely manner and such liquidated damages are not a penalty. If, however, the Work is delayed by the City, the time of the delay shall be added to the time for the completion of this Agreement. It is understood between the City and CONTRACTOR that the time specified for the completion of the Work is an essential condition to the fulfillment of this Agreement.

- 4.02 CONTRACTOR and OWNER recognize that time is of the essence of this Agreement and that OWNER will suffer financial loss if the Work is not completed within the times specified in paragraph 4.01 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by OWNER if the work is not completed on time. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty), CONTRACTOR shall pay OWNER the amount specified in paragraph 4.01 for each day that expires after the time specified in paragraph 4.01 for Substantial Completion until the Work is substantially complete. After Substantial Completion, if CONTRACTOR shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by OWNER, CONTRACTOR shall pay OWNER the amount listed in paragraph 4.01 for each day that expires after the time specified in paragraph 4.01 for completion and readiness for final payment until the Work is completed and ready for final payment.

ARTICLE 5 - CONTRACT PRICE

- 5.01 City will pay the CONTRACTOR for completion of the Work, in accordance with Contract Documents, an amount in current funds equal to the sum of the amounts determined pursuant to the amounts bid in Section 00410 of the bid document. For all Unit Price Work, an amount equal to the sum of the established unit price for each separately identified item of the Unit Price Work times the estimated quantity of that item as indicated in Section 00410 of the bid document. As provided in the General Conditions, quantity of that item as indicated in the Section 00410. As provided in the General Conditions, estimated quantities are not guaranteed, and determination of actual quantities and classifications are to be made by the ENGINEER as provided in the General Conditions. Unit prices have been computed as provided in the General Conditions.

ARTICLE 6 - PAYMENT PROCEDURES

- 6.01 Submittal and Processing of Payments

CONTRACTOR shall submit Application for Payment in accordance with the General Conditions. Application for Payment will be processed by the Engineer as provided in the General Conditions.

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6.02 Retainage

Provisions set forth in Michigan Public Acts of 1980, Act Number 524, shall be adhered to by the City and CONTRACTOR for retainage.

6.03 Substantial Completion

Upon Substantial Completion, City shall pay an amount sufficient to increase total payments to CONTRACTOR to 90 percent of the Work completed, less such amounts as Engineer shall determine in accordance with the General Conditions and less 5 percent of the Engineers estimate of the value of Work to be completed or corrected as shown on the tentative list of items to be completed or corrected attached to the certificate of Substantial Completion.

6.04 Final Payment

Upon final completion and acceptance of the work in accordance with the General Conditions, City shall pay the remainder of the Contract Price as recommended by the Engineer as provided.

ARTICLE 7 - CONTRACTOR'S REPRESENTATIONS

7.01 The CONTRACTOR has examined the premises and site and compared the same with the Drawings and Specifications so as to satisfy CONTRACTOR as to the condition of the premises. The Drawings, Plans and Specifications are intended to describe and provide for a finished piece of work and to be cooperative. If a discrepancy occurs between any of the Contract Documents, the controlling document shall be the lowest number document in the following schedule:

1. Bulletins
2. Special Provisions
3. Supplemental Specifications
4. Detailed Plans of the Project
5. General Detail Drawings
6. Detailed Specifications
7. General Specifications
8. Standard Plans
9. Supplemental General Conditions
10. General Conditions
11. Supplemental Instructions to Bidders
12. Instructions to Bidders
13. Michigan Department of Transportation's 2020 Standard Specifications for Construction.

7.02 The ENGINEER's judgement shall be final and binding on both parties.

7.03 The CONTRACTOR is familiar with and is satisfied as to all Federal, State and Local Ordinances, Laws and Regulations that may affect cost, progress, and performance of the Work.

FIRE STATION NO. 4 BUILDING IMPROVEMENTS

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- 7.04 CONTRACTOR has studied reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site.
- 7.05 CONTRACTOR has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR, including applying the specific means, methods, techniques, sequences and procedures of construction, if any, expressly required by the Contract Documents to be employed by CONTRACTOR, and safety precautions and programs incident thereto.
- 7.06 CONTRACTOR does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.
- 7.07 CONTRACTOR is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Contract Documents.
- 7.08 CONTRACTOR has correlated the information known to CONTRACTOR, information and observations obtained from visits to the Site, reports and drawings identified in the Contract Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.
- 7.09 CONTRACTOR has given ENGINEER written notice of all conflicts, errors, ambiguities or discrepancies that CONTRACTOR has discovered in the Contract Documents, and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR.
- 7.10 The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
- 7.11 CONTRACTOR has complied with EPA 40 CFR Part 32 Debarment regulations, or explained why it cannot certify the terms included in the certification.
- 7.12 CONTRACTOR shall not discriminate against any employee or applicant for employment with respect to hire, tenure, conditions, or privileges of employment, or a matter directly or indirectly related to employment because of race, color, religion, national origin, age, sex, height, weight, marital status, a disability that can be reasonably accommodated or other protected status under state or federal laws or regulations. A breach of this covenant shall be regarded as a material breach of the Contract.
- 7.13 CONTRACTOR agrees to withhold City of Port Huron income tax for all employees paid for Work or services rendered under this Contract. CONTRACTOR will remit such income taxes on a timely basis to the City of Port Huron.

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
PROJECT NO. P26-0010

This agreement is consistent with the requirements set forth under the Uniform City Income Tax Ordinance, except any provisions limiting withholding requirements shall not apply to this Contract. Failure to withhold or remit shall be regarded as a breach for which the OWNER may withhold one percent of the Contract Price.

- 7.14 CONTRACTOR agrees to provide a list of subcontractor and proof of payment to subcontractors prior to final payment. Failure to comply with this provision shall be regarded as a breach for which the OWNER may withhold sufficient funds to pay any unpaid subcontractor or supplier.
- 7.15 The Contractor shall not have the right to assert or receive claims for any loss of anticipated profit, consequential damages, including loss of bonding capacity, loss of bidding opportunities, insolvency, and the effects of force account work on other projects, or business interruption, attorney fees, claim preparation expenses, and the cost of litigation. The Contractor hereby expressly waives the right to assert any such claims in any proceeding or process including but not limited to litigation.

ARTICLE 8 - CONTRACT DOCUMENTS

8.01 Contents

A. The Contract Documents consist of the following:

1. This Agreement (pages 00500-1 to 00500-8, inclusive)
2. Maintenance Bond (page 00613-1)
3. Performance Bond (page 00614-1)
4. Labor and Material Bond (page 00615-1)
5. General Conditions (pages 00700-1 to 00700-57, inclusive)
6. Supplementary Conditions (00800-1 to 00800-4, inclusive)
7. Special Project Conditions (00810-1 to 00800-6, inclusive)
8. Specifications as listed in the Table of Contents of the Project Manual
9. Addenda(s)
10. Exhibits to this Agreement
 - A. Notice to Proceed
 - B. Contractors Bid (pages 00410-1 to 00410-3, inclusive)
 - C. Documentation submitted by the CONTRACTOR prior to Notice of Award

10. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:

- A. Written Amendments;
- B. Work Change Directives;
- C. Change Orders.

B. The Contract Documents may be modified only by a written document signed by both parties. Any claimed modifications which are not in writing shall be unenforceable.

ARTICLE 9 - MISCELLANEOUS

9.01 Assignment of Contract

The Contractor shall not assign his Contract or any part thereof without the prior written consent of the City Engineer as determined in his/her sole discretion, and in no case shall such consent relieve the Contractor or Contractors, from the obligations herein entered into by the same or change the terms of the agreement. No assignment of this Contract shall be valid unless it shall contain a provision that the funds to be paid to the assignee under the assignment are subject to a prior lien for services rendered or materials supplied for the performance of the Work or called for in said Contract in favor of all persons, firm, corporations rendering such services or supplying such materials.

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

9.02 Successors and Assigns

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

9.03 Severability

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

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
PROJECT NO. P26-0010

9.04 Notices

Any notices required under this Agreement shall be sent by certified mail, return receipt or by FedEx or UPS. The notices shall be sent as follows:

City of Port Huron
Attn: City Engineer
100 McMorran Boulevard
Port Huron, MI 48060

Contractor

Email: _____

9.05 Dispute Resolution and Applicable Law

Any claims or disputes between the parties shall be resolved by litigation in St. Clair County Circuit Court. The parties agree venue is proper in St. Clair County Circuit Court and agree not to challenge venue in St. Clair County Circuit Court. The parties agree the interpretation of this Agreement and any disputes between them shall be governed by Michigan law. To the extent permissible by law, the parties both agree to waive their right to a jury trial in the event of any litigation between them arising out of this Agreement.

9.06 Amendment

This Agreement may only be amended by a written document signed by the parties. No modification to the Contract Sum or the Completion Date for the Work shall be binding on the City unless such changes are approved in writing by the City Engineer.

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
PROJECT NO. P26-0010

IN WITNESS WHEREOF, the City of Port Huron officials signing below are authorized to sign this agreement as provided for in the 2011 City Charter of the City of Port Huron, Chapter 10, Section 10-1.

CITY OF PORT HURON

APPROVED AS TO SUBSTANCE:

James R. Freed, City Manager

Anita R. Ashford, Mayor

APPROVED AS TO FORM:

ATTESTED TO:

, City Attorney

Cyndee M. Jonseck, City Clerk

**CERTIFIED AS TO SUFFICIENCY
OF FUNDS:**

Lee Ward, Director of Finance

Dated: _____

CONTRACTOR: _____

By: _____

Its: _____

Dated: _____

NOTE: This signature sheet is for the agreement with [**COMPANY NAME**] for the Fire Station No. 4 Building Improvements.

MAINTENANCE BOND

KNOW THAT ALL MEN BY THESE PRESENTS, that _____, of

_____, as principals, and _____

of _____ as sureties, are held and firmly bound unto the City of Port Huron, in the sum of _____ (\$ _____) Dollars, in lawful money of the United States of America, to be paid to the said CITY OF PORT HURON, or to its certain attorney, or assigns, to which payment, well and truly to be made, we bind ourselves, our heirs and executors, and administrators, and each and every one of them, firmly by these presents.

Signed and sealed with our seals and dated at _____ this _____ day of _____, 20____.

The condition of this obligation is such that whereas, the said above named principal has entered into a contract with the City of Port Huron for the Fire Station No. 4 Building Improvements, Project No. P26-0010 which said contract is hereto attached.

NOW, THEREFORE, the condition of this obligation is that if the contractor shall keep in repair and make good any defect in material or construction that shall appear within one year from the date of the completion and acceptance of the work covered by this attached contract and with the terms and stipulations of these attached specifications, this shall be null and void and otherwise remain in full force and effect.

Principal: _____

By: _____

Title: _____

Surety: _____

By: _____

Title: _____

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
PROJECT NO. P26-0010

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that _____ of _____,
_____, as principal and _____ of,
_____ as sureties are held and firmly bound
unto the City of Port Huron, Michigan, in the sum of _____ (\$ _____)
Dollars, lawful money of the United States, to be paid to the said City of Port Huron, Michigan or to
its assigns, in accordance with the provisions of Act No. 213 of the Public Acts of Michigan, Session
of 1963, to which payment well and truly to be made, we bind ourselves, our heirs, executors,
administrators, successors and assigns, and each and every one of them, firmly by these presents,
and, WHEREAS, the above bounden principal has been awarded the contract with the City of Port
Huron for Fire Station No. 4 Building Improvements, Project No. P26-0010 and the performance of
certain work as more fully appears as set out in the contract hereto attached.

NOW, THEREFORE, the condition of this obligation is such that, if the said _____,
heirs, executors, administrators, successors or assigns, shall duly perform and observe all the
stipulations and agreements contained in the said contract, and on his/her/their/its part to be
performed and observed, and so that any alteration which may be made by agreement between the
said _____, and the said City of Port Huron, in terms of said contract, or the
nature of the work to be done there under, or the giving by said City of Port Huron of any extension
of time for performing the said contract, or of any of the stipulations therein contained, and on the
part of the said _____, heirs, executors, administrators, successors or assigns,
shall not in any way release the said sureties, their heirs, executors, administrators, successors or
assigns, from liability under the above-written bond, then this obligation to be void; otherwise to
remain in full force and effect.

In witness whereof we have hereunto set our hands and seals this ____ day of _____, A.D.
20____.

Principal: _____

By: _____

Title: _____

Surety: _____

By: _____

Title: _____

LABOR AND MATERIAL BOND
(State - New Form, Act 213 - 1963)

KNOW ALL MEN BY THESE PRESENTS, that _____ of _____,
_____, as Principal, and _____ of

_____, as sureties, are held and firmly bound unto
the City of Port Huron, Michigan, in the sum of _____ (\$ _____) Dollars,
lawful money of the United States, to be paid to the said City of Port Huron, Michigan, or to its
assigns, in accordance with the provisions of Act No. 213 of the Public Acts of Michigan, Session of
1963, to which payment well and truly to be made, we bind ourselves, our heirs, executors,
administrators and assigns and each and every one of them, firmly by these presents, and

WHEREAS, the above bounden principal has been awarded the contract with the City of Port Huron
for Fire Station No. 4 Building Improvements, Project No. P26-0010 and for the performance of
certain work as more fully appears as set out in the contract hereto attached.

NOW, THEREFORE, the condition of this obligation is such that if there shall be paid, as the same
may become due and payable, all indebtedness which may arise from said Contractor to a sub-
contractor or a party performing labor or furnishing materials or both, or from any sub-contractor to
any person, firm or corporation on account of any labor performed or materials, reasonably
requested for use in the performance of the contract, then this obligation to be void, otherwise to
remain in full force and virtue.

IN WITNESS WHEREOF we have hereunto set our hands and seals this _____ day of _____,
A.D. 20____.

Principal: _____

By: _____

Title: _____

Surety: _____

By: _____

Title: _____

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
PROJECT NO P26-0010

SECTION 00619 - POWER OF ATTORNEY

Attach Power of Attorney
to this page

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
PROJECT NO: P26-0010

SECTION 00623 - CERTIFICATES OF INSURANCE

Attach Certificates of Insurance
to this page

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SECTION 00700 - GENERAL CONDITIONS

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

1.01 Defined Terms

- Addenda:* Written or graphic instruments issued prior to the opening of Bids, which clarify, correct, or change the Bidding Requirements or the Contract Documents.
- Adjustment:* The change to the Contract made by the City Engineer as a result of the Contractor filing a Claim.
- Agreement:* The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.
- Application for Payment:* The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
- Asbestos:* Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
- Bid:* The offer or proposal of a bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
- Bidding Documents:* The Bidding Requirements and the proposed Contract Documents (including all Addenda issued prior to receipt of bids).
- Bidding Requirements:* The Advertisement or Invitation to Bid, Instruction to Bidders, bid security form, if any, and the bid form with any supplements.
- Bonds:* Performance and payment bonds, bid bond, labor and material bond and maintenance bond and other instruments of security which are provided by a surety and are in a form which are acceptable to the City.
- Change Order:* A document approved by City Council which is signed by the Contractor and the City Engineer which authorizes payment for additions, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Time, issued on or after the effective date of the Agreement.

Work Change

Directive: A document recommended by the Engineer which is signed by the Contractor which authorizes additions, deletions or revisions in the Work or an Adjustment in the Contract Price or the Contract Times, issued on or after the effective date of the Agreement.

City: The term used in these specifications shall mean the Incorporated City of Port Huron, Michigan, acting through the Mayor and City Council or their duly authorized representatives.

City Engineer: The Engineer for the City acting as the Director of Public Works.

City

Manager: Term used in these specifications shall mean the City Manager of the City of Port Huron, Michigan.

Civil Engineer

I, II or III: The Engineer representing the City who is responsible for Engineering Supervision of the construction.

Claim: A demand or assertion by Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

Contract: The entire and integrated written agreement between the City and the Contractor concerning the Work. The Contract supersedes prior negotiations, representation, or agreements whether oral or written.

Contract

Documents: The Contract Documents establish the rights and obligations of the parties and include the Agreement, Addenda (which pertain to the Contract Documents), Contractor's Bid (including documentation accompanying the Bid and any post Bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Agreement, the Notice to Proceed, the Bonds, these General Conditions, the Supplementary Conditions, the Special Provisions, the Specifications and the Drawings as the same are more specifically identified in the Agreement, together with all Written Amendments, Change Orders, Work Change Directives, Field Orders, and Engineer's written interpretations and clarifications issued on or after the Effective Date of the Agreement. Approved Shop Drawings and the reports and drawings of subsurface and physical conditions are not Contract Documents. Only printed or hard copies of the items listed in this paragraph are Contract Documents. Files in electronic media format of text, data, graphics, and the like that may be furnished by City to Contractor are not Contract Documents.

Contract

Price: The moneys payable by the City to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement.

Contract

Times: The number of days or the dates stated in the Agreement to: (i) achieve Substantial Completion; and/or (ii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.

Contractor: The individual or entity with whom Owner has entered into the Agreement.

Day: The Work Day shall constitute a calendar day of 24 hours measured from midnight to the next midnight.

Defective: The word "defective" when modifying the word "Work" refers to Work that is unsatisfactory, faulty, or deficient in that it does not conform to the Contract Documents or does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents, or has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with paragraph 14.04 or 14.05).

Drawings: That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.

Effective Date

of Agreement: The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

Engineer: Unless specifically stated as City Engineer, Engineering Manager or Civil Engineer I, II or III; Engineer refers to any of these. These terms are further defined elsewhere in this section.

Engineering

Manager: The Engineer representing the City in the absence of the City Engineer or the Civil Engineer I, II, or III.

Field Order: A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or Contract Times.

Force

Account: Term used to specify how a Contractor will be paid if no agreement can be reached by the Engineer on a Claim.

Furnish: The word "furnish" when used in connection with services, materials, or equipments, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

General

Requirements: Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.

Hazardous Environment

Condition: The presence at the Site of Asbestos, PCB's, Petroleum, Hazardous Waste, Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.

Hazardous

Waste: The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

Install: The word "install" when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials.

Laws and

Regulations: Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

Liens: Charges, security interests, or encumbrances upon project funds, real property, or personal property.

Milestone: A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

Notice of

Award: The written notice by the City to the apparent successful bidder stating that upon timely compliance by the apparent successful bidder with the conditions precedent listed therein, City will sign and deliver the Agreement.

Notice to

Proceed: A written notice given by the City to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.

Owner: Shall mean the City of Port Huron.

Partial

Utilization: Use by City of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all the Work.

PCB's: Polychlorinated biphenyls.

Perform or

Provide: The words "perform" or "provide" when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

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- Petroleum:* Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-hazardous waste and crude oils.
- Project:* The total construction of which the Work to be performed under the Contract Documents may be the whole or a part as may be indicated elsewhere in the Contract Documents.
- Project Manual:* The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the Table(s) of Contents.
- Radioactive Material:* Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
- Resident Project Representative:* The authorized representative of Engineer who may be assigned to the Site or any part thereof.
- Samples:* Physical examples of material, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
- Shop Drawings:* All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
- Site:* Lands or areas indicated in the Contract Documents as being furnished by City upon which the Work is to be performed, including right-of-ways and easements for access thereto, and such other lands furnished by City which are designated for the use of Contractor.
- Specifications:* That part of the Contract Documents consisting of written technical descriptions of materials, equipment, systems, standards, and workmanship as applied to the Work and certain administrative details applicable thereto.
- Subcontractor:* An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.

Substantial

Completion: The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.

Supplementary

Conditions: That part of the Contract Documents which amends or supplements these General Conditions.

Supplier: A manufacturer, fabricator, supplier, distributor, material, or vendor having a direct contract with Contractor or any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or any Subcontractor.

Surety: The legal entity which is bound with and for the Contractor for the performance of the Contract and for the payment of all lawful indebtedness pertaining thereto.

Underground

Facilities: All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

Unit Price

Work: Work to be paid for on the basis of unit prices.

Work: The entire completed construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

Written

Amendment: A written statement modifying the Contract Documents, signed by Owner and Contractor on or after the Effective Date of the Agreement and normally dealing with the non-engineering or nontechnical rather than strictly construction-related aspects of the Contract Documents.

Unless stated otherwise in the Contract Documents, words or phrases which have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

Whenever in the Contract Documents the terms “as allowed,” “as approved,” or terms of like effect are used or the adjectives “reasonable,” or like effect are used to describe an action or determination of the Engineer as to the Work, it is intended that such action or

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determination will be solely to evaluate, in general the completed Work for compliance with the requirements of an information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or

indicated in the Contract Documents (unless this is a specific statement indicating otherwise.)

The use of any such term or adjective shall not be effective to assign to the Engineer any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility contrary to the provisions set forth in the Contract Documents.

ARTICLE 2 - PRELIMINARY MATTERS

2.01 - Interpretation of Quantities in Bid Schedule:

The quantities appearing in the bid proposal are estimated and will be used in the comparison of proposals. Payment to the Contractor will be for the actual quantities of work performed and accepted or materials furnished according to the contract. The quantities of work and materials as provided in the contract may be increased, decreased, or deleted, in sections 103.02A, B or F of the Michigan Department of Transportation's 2020 Standard Specifications for Construction.

2.02 - Examinations of Plans, Specifications, and Site of the Work:

Prior to submitting a bid, the Bidder must:

- A. Examine the proposal, plans, and the work site to understand the local conditions affecting the work and the detailed requirements of construction.
- B. Upon discovery of uncertainties, inconsistencies, errors, omissions, or conflicts during the examination of the proposal, plans and work site, notify the City's representative identified in the proposal.
- C. Be familiar with all requirements of federal, state, and local laws, ordinances, and permits that may directly, or indirectly, affect performance of the work.

The City considers the submission of a bid proposal as prima facie evidence that the Bidder examined the proposal, plans, and the project site, and understands the requirements of the proposal package and conditions at the project site.

The Bidder must not take advantage of errors or omissions in the proposal that could make the bid mathematically or materially unbalanced. Failure to notify the City of errors and omissions may result in the City's rejection of the bid.

2.03 - Preparation of Proposals:

The proposal shall be legibly prepared in ink or typed on the form provided. The Bidder shall complete all blanks on the Bid form.

The proposal shall be signed by an authorized representative of the Bidder and include the complete address of the Bidder.

A Bidder may alter a unit or lump sum price entered on the proposal. To make an alteration, the Bidder shall cross out the entry, and enter the new figure above or below the deleted entry. An authorized representative of the Bidder must initial on the line of the change. Any alteration and initials shall be handwritten in ink.

2.04 - Delivery of Proposal:

The proposal shall be submitted in a sealed envelope which shall clearly state the name of the bidder, address of bidder, the job the bid is for and the time and the date the bid is to be opened. The bid shall be submitted to the room called out in the advertisement prior to the time and date specified. Proposals submitted via any other method will not be accepted.

2.05 - Opening of Bids:

The bids shall be opened publicly and the total amount of each bid read aloud at the time and place specified in the advertisement. After checking all bids, the unit prices of the bidders may be made public if requested. Up to the time specified in the advertisement a bidder may request to withdraw the bid.

2.06 - Consideration of Proposals:

To determine the lowest bidder, the proposals will be compared on the basis of the sum of products or quantities and unit bid prices. In case of discrepancy between the calculated total and the total shown in the proposal, unit prices as written in the proposal shall govern and all errors found in said computations will be corrected.

The City may reject proposals, waive any irregularities and accept any proposal that it determines is in the best interest of the City regardless of whether the proposal is the lowest proposal, or proceed to do the work in any other way it determines is in the best interest of the City.

2.07 - Notice of Award:

After the Project has been awarded by Council, within 10 days the Contractor will receive a Notice of Award and copies of the Contract Documents to be executed and returned. No work can be done on site until the Contractor receives the Notice to Proceed from the City.

2.08 - Copies of Documents:

City shall furnish to the Contractor, for signature(s), bonds and insurance, three (3) copies of the Contract Books within 10 days of notice of award. These shall be returned within 28 days of the Notice of Award and must be deemed acceptable by the City before the Notice to Proceed can be issued. Four (4) copies of the Contract Books and/or Plans will be furnished at no additional cost to the contractor. Any additional copies (beyond the four (4) that are furnished) will be paid for at the cost of reproduction.

2.09 - Forfeiture:

Failure on the part of the awarded Contractor to execute the Contract forms and file satisfactory insurance and bonds and other required documents within 28 days after the Notice of Award, may result in the forfeiture of the proposal guaranty to the City. The City then reserves the right to further Award the project to an alternative bidder.

2.10 - Return of Proposal Guarantees:

Proposal guarantees, other than those provided as proposal bonds, of all Bidders except the determined lowest bidder and all potential appeal Bidders, will be returned promptly following the opening of the Proposals. The City will hold the proposal guaranty until the Contractor has been given a Notice to Proceed.

2.11 - Preconstruction Meeting:

Within Twenty (20) days after the Notice of Award, but before any Work at the site is started, a conference attended by the Contractor, Engineer and others as appropriate will be held to establish a working understanding among the parties to the Work and to discuss the schedules, procedures, lines of authority, submittals, Application for Payment and maintaining records and other pertinent information.

2.12 - Notice to Proceed:

After the City has received the proper insurance, bonds, schedules and Contract Documents and they are deemed acceptable, Documents will be executed by the City and the Contractor will be issued a Notice to Proceed. No work may start on the project until this notification has been given. Failure of the City to give Notice to Proceed before the 28th day after receiving acceptable Contract Documents shall entitle contractor to an extension of time for the completion of the Project.

2.13 - Starting the Work:

Contractor shall start to perform the Work within ten (10) days of the Notice to Proceed or a date mutually agreed upon. City and the Contractor shall agree upon this date at the pre-construction meeting. No Work shall be done at the site prior to the Contractor receiving the Notice to Proceed.

2.14 - Commencement of Contract Times:

The contract times will commence to run on the day that the Notice to Proceed is given or a date mutually agreed upon. The Notice to Proceed may be given at any time within ninety days (90) after the bid opening. After the ninety days (90) are up, the Contractor may withdraw the bid with no penalty.

ARTICLE -3 BONDS AND INSURANCE

3.01 - Proof of Insurance Coverage:

The Contractor shall provide the City, at the time the contracts are returned for execution by the City, proof of insurance coverage on AIA Document G705 or Accord Form 25-S. The City will review all coverage's and bonds shall be with insurance companies licensed and "admitted" to do business in the State of Michigan. An additional requirement, that coverage be with carriers "acceptable to the Member," is also required. All insurance and bonds shall be with carriers which has a minimum Best's Insurance Reports rating of A+ (Superior) or A or A- ((Excellent). Upon acceptance of the proof of coverage by the City, documents will be executed by the City. Proof of coverage shall include:

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- A. An original and three (3) copies of the certificates of coverage of Contractor's Workmen's Compensation.
- B. An original and three (3) copies of the certificates of coverage of Contractor's Commercial General Liability.
- C. An original and three (3) copies of the certificates of coverage of the Contractor Motor Vehicle Liability Insurance.
- D. An original and three (3) copies of the certificates of coverage of the Contractor's Excess Liability Insurance.
- E. A certified copy of the Contractor's Protective Liability Insurance policy shall be issued to the City prior to the start of the work.

3.02 - Bonds:

The Contractor shall not commence work or continue work, nor shall any subcontractor be allowed to commence or continue to work under this Contract, until all Bonds required under this paragraph have been submitted to the City and approved by the City. All Bonds shall be with sureties acceptable to the City.

- A. Performance Bond - The Contractor shall furnish a Surety Bond (form attached) in an amount at least equal to one hundred (100%) percent of the Contract Price as surety for faithful performance of this Contract.
- B. Labor and Material Bond - The Contractor shall furnish a separate Surety Bond (form attached) in an amount at least equal to one hundred (100%) percent of the Contract Price as security for the payment of all persons performing labor and furnishing materials in connection with this Contract.
- C. Maintenance Bond - The Contractor shall furnish a Surety Bond (form attached) in an amount at least equal to one hundred (100%) percent of the Contract Price as security for the maintenance and repair of any defects in material or construction that shall appear within one (1) year from the date of completion and acceptance of the work covered by this Contract.
- D. Additional or Substitute Bond - If at any time the City, for a justifiable cause, shall become dissatisfied with any Sureties pursuant to the Performance, Payment Bonds or Maintenance Bonds, the Contractor shall within five (5) days after such notice from the City to do so, substitute an acceptable bond(s) in such forms and sum and signed by such other surety as may be satisfactory to the City.

The premiums on such bond(s) shall be paid for by the Contractor. No further payments shall be deemed due nor shall be made until the new Surety or Sureties shall have furnished such an acceptable bond to the City.

3.03 - Insurance:

- A. The Contractor shall not commence work or continue work, nor shall the Contractor allow any subcontractor to commence or continue to work under this Contract, until all insurance policies or certificates of insurance required under this paragraph have been submitted to the City and approved by the City. The Contractor shall either (1) require each of his subcontractors to procure and maintain during the life of his subcontract, Statutory Workmen's Compensation Insurance, Comprehensive Automobile Liability Policy of the types and in the amounts specified for the Contractor, or (2) insure the activities of his subcontractors in his own policies. All coverages shall be with insurance companies licensed and admitted to do business in the State of Michigan. All coverages shall be with insurance carriers acceptable to the City of Port Huron.
- B. Liability limits over \$1,000,000 per occurrence may be obtained by providing Excess Liability (Umbrella) coverage in addition to the General Liability Coverage.
- C. Coverage must be provided by insurance carriers licensed to do business in Michigan and rated not less than A by A.M. Best.

3.04 - Workmen's Compensation Insurance:

- A. The Contractor shall procure and maintain during the life of this contract, Workmen's Compensation Insurance, including Employer's Liability coverage in accordance with all applicable statutes of the State of Michigan.

3.05 - Commercial General Liability Insurance:

- A. The Contractor shall procure and maintain during the life of this Contract, Commercial General Liability Insurance on an "Occurrence Basis" with limits of liability not less than \$3,000,000 per occurrence and/or aggregate combined single limit, Personal Injury, Bodily Injury and Property Damage. Coverage shall include the following extensions: (A) Contractual Liability; (B) Products and Completed Operations; (C) Independent Contractors Coverage; (D) Broad Form General Liability Extensions or equivalent; (E) Deletion of all Explosion, Collapse and Underground (XCU) Exclusions, if applicable.
- B. Limits of liability shall be in an amount of not less than that listed above, unless stated otherwise in Section 00800, Supplementary General Conditions of these Contract documents
- C. The Bidders' Commercial General Liability Insurance shall not contain any restrictions or endorsements amending coverage for potential liability arising out of water/sewer backup.

3.06 - Motor Vehicle Liability Insurance:

- A. The Contractor shall procure and maintain during the life of this Contract, Motor Vehicle Liability Insurance, including Michigan No-Fault Coverages with limits of liability of not less than \$3,000,000 per occurrence combined single limit Bodily Injury and Property Damage. Coverage shall include all owned vehicles, all non-owned vehicles and all hired vehicles.
- B. Limits of liability shall be in amount of not less than that listed above, unless stated otherwise in Section 00800, Supplementary General Conditions, of these Contract Documents.

3.07 - Owner's and Contractors Protective Liability Insurance:

- A. The Contractor shall procure and maintain during the life of this Contract, a separate Owner's & Contractor's Protective Liability Policy with limits of liability not less than \$3,000,000 per occurrence and/or aggregate combined single limit, Personal Injury, Bodily Injury and Property Damage.
- B. As an alternative, a per project aggregate on the Commercial General Liability insurance policy may be an acceptable substitute to the OCP policy.
- C. Limits of liability shall be in an amount of not less than that listed above unless stated otherwise in the Supplementary Conditions, Section 00800 of the Contract Documents.

3.08 - Additional Insured:

- A. Commercial General Liability and Vehicle Liability Insurance coverage as described above shall include an endorsement stating the following shall be Additional Insured: the City, all elected and appointed officials, all employees and volunteers, all boards, commissions and/or authorities and their board members including employees and volunteers, staking and resident project representatives thereof.
- B. This coverage shall be primary to the Additional Insured, and not contributing with any other insurance or similar protection available to the Additional Insured, whether said other available coverage be primary, contributing, or excess.

3.09 - Property Insurance:

- A. If project includes above-ground structure(s), or is otherwise required in the Supplementary Conditions, Section 00800 of the contract, the Contractor shall purchase and maintain property insurance upon the work and material relative to the work, wherever located or in transit, to the full insurable value thereof (or required by law). This insurance shall include the interests of the City, Contractor and subcontractors in the work, shall insure against the perils of fire, wind, storm and extended coverage and shall include "all risk" insurance for physical loss and damage including theft, vandalism and malicious mischief, collapse and water damage, and shall include damages, losses and expenses arising out of or resulting from any insured loss or incurred in the repair or replacement of any insured property (including fees and charges of engineers, architects, attorneys and other professionals). If not otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain similar property insurance on portions of the work stored on and off the site or in transit when such portions of the Work are to be included in an application for payment. The policies of insurance required to be purchased shall contain a provision that the coverage afforded will not be cancelled or materially changed until at least thirty days (30) prior written notice has been given to the City.

An insurance certificate for this insurance shall be submitted at the same time as the other insurance certificates the Contractor must furnish.

3.10 - No Waiver of Claim:

Neither the acceptance of the whole or part of the work by the City or the Engineer or any of the agents of the City, nor any order, measurement or certificate by the Engineer, nor any orders by the City of its agents for the payment of money, nor any payment of money, nor any extension of time, nor any possession taken by the City or its agents, shall operate as a waiver for any portion of the contract or for any power therein reserved to the City or for any right to damages therein provided; nor shall any waiver of any breach of the contract be held to be a waiver of any other or subsequent breach.

ARTICLE 4 - INTENT OF THE CONTRACT DOCUMENTS

4.01 - Intent:

The contract documents are complementary; what is called for by one is as binding as if called for by all. The intention of the contract documents is to describe a complete project to include the contract price or prices, the cost of all labor and materials, water, fuel, tools, plant equipment, light, power, transportation and all other expenses as may be necessary for the proper execution of the work. The work shall be executed in strict conformity with the plans and specifications and the Contractor shall do no work without proper drawings and instructions.

4.02 - Reference Standards:

In interpreting the contract documents, words describing materials or work which have a well-known technical or trade meaning, unless otherwise specifically defined in the contract documents, shall be construed in accordance with such well-known meanings recognized by engineers, architects, and the construction industry.

4.03 - Hierarchy of Documents:

If there is a discrepancy in the contract documents, the following order will prevail:

1. Bulletins/Addendums
2. Special Provisions
3. Special Conditions
4. Detailed Plans of Project
5. General Detail Drawings
6. Detailed Specifications
7. General Specifications
8. Standard Plans
9. Supplemental General Conditions
10. General Condition
11. Supplemental Instructions to Bidders
12. Instructions to Bidders
13. Michigan Department of Transportation's 2020 Standard Specifications for Construction

4.04 - Resolving Discrepancies:

Any and all intents to file a claim(s) for extra compensation, whether on behalf of the Contractor or a Subcontractor, shall be signed and made directly by the Contractor.

Failure of the Contractor to file an intent of a claim before beginning the work the Contractor intends to base a claim on, shall constitute a waiver of the claim. To ensure the Engineer has an opportunity to maintain records, Contractor shall provide verbal notice to the Resident Project Representative of an intent to file a claim prior to starting work on the activity the Contractor intends to file a claim for. That same day the Contractor shall follow up this verbal notice in writing (fax or email is acceptable) to the Engineer. Failure of the Contractor to file an intent of a claim in writing the same day that verbal notice is provided to the Resident Project Representative, shall constitute a waiver of claim.

Failure of the Contractor to give notification will constitute a waiver of the claim for extra compensation.

Once the Contractor files a Notice of Intent to file a claim, the Contractor shall keep accurate records of all costs of the work or delay and shall afford the Engineer every facility for keeping costs of the work or delay which is the subject matter of the claim. The Contractor and the Engineer shall compare records and bring them into agreement at the end of each day.

The validity of the claim shall not be established either by the filing of a Notice of Intent to file a claim by a Contractor or the keeping of the costs records by the Engineer. A Contractor shall file a Notice of Claim with the Engineer for every claim for extra compensation or delay within the above time frames.

The Contractor may file a claim as permitted under the contract documents not later than 3 days after the work involved is completed and only concerning claims for which a written notice of intent was given. Any claim not filed in accordance with this procedure and timeline is deemed waived.

The Contractor's claim shall include all facts which give rise to the claim, a copy of the specific provisions of the contract which supports the claim and the dollar amount of the claim with an explanation as to how that figure was established. The claim shall include certification by the

Contractor that the claim was made in good faith with accurate and complete supporting data and the amount requested accurately reflects the amount for which the Contractor believes the City is liable. Any claim not containing this certification by the Contractor will be deemed waived. In addition to the certification, the Contractor's claim shall contain the following information, as applicable:

1. A detailed factual statement of the claim providing necessary dates, locations, and items of work related to and included in the claim.
2. The date or dates on which actions resulting in the claim occurred or conditions resulting in the claim became evident.
3. Identification of documents substantiating the Contractor's claim.
4. Identification of the provisions of the contract that support the claim and a statement of the reasons these provisions support the claim.
5. A detailed compilation and a breakdown of the amount of additional compensation sought as follows:
 - a. Documented additional labor costs;
 - b. Documented additional material costs;
 - c. List of additional equipment costs, including each piece of equipment and the rental rate claimed for each; and
 - d. Other additional direct costs or damages, and associated supporting documentation.
6. For a claim related to an extension of time, a detailed compilation of the specific dates and the exact number of calendar days sought for the time extension, the basis for entitlement to time for each day, all documentation of the delay, and all impacts of the delay to the progress schedule and critical path.

Subcontractors must document and certify their claim(s) as described above. If the Contractor has a claim item related to a Subcontractor's claim, the Contractor must document and certify their claim as described above.

The Engineer will review the timely filed claims with the following procedure:

- A. Upon receipt of the detailed claim, the Civil Engineer I, II or III, the Engineering Manager and/or the City Engineer will carefully review all available aspects of the claim, have a meeting with the Contractor, and arrive at a conclusion. The determination at this level will be made by the City Engineer. The Contractor will then be notified in writing within 45 days of the meeting what decision has been made.

If the Contractor does not agree with the City Engineer's determination, the Contractor shall, within 30 days, contact the City Engineer in writing requesting further review of the claim. In the request for further review, the Contractor shall provide a complete statement of the relief requested. The City Engineer shall review the Contractor's submittal, meet with the Contractor if necessary, and make a final determination. If a decision cannot be reached at the City Engineer's level, the City Manager or an appointed Consulting Engineer will review all documents with the Contractor and the City Manager and a determination will be made.

Any change in the claims procedures set forth in the contract documents will only be binding on the Owner if such changes are made in writing and signed by the City Engineer. The Contractor shall not assert any claims which deviate from the claims procedures set forth in the contract documents.

ARTICLE 5 - USE OF LANDS, SUBSURFACE AND PHYSICAL CONDITIONS

5.01 - Existing Improvements (Utilities):

Certain surface and subsurface structures and utilities have been shown on the plans as an aid to the Contractor, but the City does not guarantee their location or that other structures or utilities may not be encountered. It shall be the responsibility of the Contractor to make arrangements with the owner of the respective utilities for the establishment of their location, prior to beginning the construction.

The Contractor shall assume full responsibility for the protection of all utilities, water, sewer, gas, telephone, cable, or any other utility either public or private along or near the line of work and will be held responsible for any damages to such utilities arising from the Contractor's operation. If, for the Contractor's convenience, the Contractor desires that any portion of the utilities be moved to facilitate operations, the Contractor shall make all necessary arrangements with the owner of the respective utilities, and pay all costs resulting from this work.

Sanitary and water service leads are private lines. They belong to the homeowner according to the City Code of Ordinances. Therefore, if these services are marked or not marked by the MISS DIG system, and are damaged, the responsibility to fix them will be that of the Contractor. The water shut-off box locations of known service leads will be marked with a blue flag and or a blue paint circle. There is no assumption by the City as to how the water service lead gets to the water main from there. It is the Contractor's responsibility to determine this.

In cases where utilities, water, gas, telephone, cable or any other utilities either public or private are directly in the line of the structures being constructed, and the City deems it necessary that the said

utility be moved, the said company or companies agents or superintendents will be notified by the Engineer to remove the same within a specified time.

The Contractor shall not interfere with the said utility or any portion thereof, until the expiration of the time specified in said notice. The Contractor will not be held responsible for any costs resulting from this work.

In all cases where there is a dispute between the Contractor and the Owner of the respective utility, as to the necessity of moving or repairing same, the Engineer shall make the final decision in the matter, which decisions shall be binding on the respective parties, and order the respective parties to proceed accordingly.

5.02 - Availability of Lands:

The City shall furnish the construction site. The City shall notify the Contractor of any encumbrances or restrictions not of general application but specifically related to use of the site with which the Contractor must comply in performing the work. The City will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If the Contractor and the City are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the contract price or contract times, or both, as a result of any delay in the City furnishing the site, the Contractor may make a claim as provided in the contract documents.

5.03 Contractors Yard:

Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of material and equipment as permitted by the City Code of Ordinances. Contractor will not be allowed to use the City's private property unless given written consent by the City Engineer. No temporary fence shall be erected until a permit is given by the City's Permit Department.

5.04 - Storage on the Construction Site:

Contractor shall be required to carry on the project in such a manner as to cause the least possible obstructions to the streets. The Contractor shall confine equipment, apparatus, the storage and operations of the Contractor's workmen to limits indicated by the law or ordinances, permits or directions of the City, or by the rights of the owners of nearby private property and shall not encumber the premises with the Contractor's materials. The materials for the work may be neatly and compactly piled along the side of the boulevard as delivered as the Engineer may designate, in such manner as to cause the least inconvenience to the property owner and general public, and not to be within 25' of any fire hydrant, or prevent free access to water shut-offs. Material shall not be stored in the boulevards during a winter shut down period. Shade trees and other improvements shall be protected from damage. Any damage to lawns, public or private sidewalk approaches, or other improvements such as sprinkler systems, which may occur on account of the work, including the piling of materials therefore, shall be made good to the satisfaction of the Engineer at the Contractor's expense.

5.05 - Subsurface and Physical Conditions:

The log of borings are those reports of explorations and test of subsurface conditions at the site the Engineer has used in preparing the contract documents, and are located in the proposal. Soil notations and boring logs shown on the plans are for information only and shall not relieve the Contractor of the responsibility of investigating all local conditions before bidding.

5.06 - Differing Subsurface or Physical Conditions:

During the progress of the work, if subsurface conditions are encountered at the site differing materially from those indicated in the contract or if unknown physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the work provided for in the contract, are encountered at the site, the party discovering such conditions shall promptly notify the other party in writing of the specific differing conditions before the site is disturbed and before the affected work is performed.

No contract adjustment will be allowed under this clause for any effects caused on unchanged work or if the Contractor has not provided the proper written notice.

Upon written notification as established in the *Resolving Discrepancies* section, the Engineer will investigate the conditions, and if it is determined that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the contract, an adjustment, excluding anticipated profits, will be made and the contract modified in writing accordingly.

If the Contractor and the City agree that compensation is due for an allowable adjustment, but no agreement is reached as to the basis for payment, the work shall proceed and be paid for under the *Force Account* section.

5.07 - Boulevards:

Contractor is responsible for fixing any sprinkler systems that is broken by the work. This work shall be incidental to the project.

A. Yard Ornaments/Brick Sidewalks etc.

If the work will require the damage or removal of existing yard ornaments, brick pavers, etc. in a homeowner's lawn, then the homeowner must be notified before the Contractor works in this area. The Contractor shall restore the yard to as good or better condition than before starting the work.

B. Trees:

Any tree that is to be removed must first be evaluated by the City's Forestry Division.

ARTICLE 6 - CONTRACTORS RESPONSIBILITIES

6.01 - Supervision:

The Contractor shall provide project management to properly oversee the work. The Contractor shall have a competent superintendent who shall have authority to act on behalf of the Contractor. The superintendent shall be responsible for handling any delays or problems with workmanship. The superintendent shall minimize construction impacts on property owners and businesses. All communications given to or received from the Superintendent shall be binding on the Contractor.

6.02 - Competence of Workers:

The Contractor shall supply sufficient labor to perform the work required by the contract. Workers shall have sufficient skills and experience to perform the work assigned to them in conformance with the contract.

6.03 - Labor:

Contractor shall provide competent, suitably qualified personnel to understand and construct the project by using the City's survey and lay out. The work will be constructed as required by the contract documents. Contractor shall at all times maintain good discipline and order at the site.

6.04 - Contractors Means and Methods:

The Contractor shall use equipment of correct size and in a mechanical condition needed to do the work of the contract. Means and methods of performing the work shall be the Contractor's judgment and responsibility.

6.05 - Performance of the Work:

No work shall be performed on Sunday, a City holiday, or after 9:00 p.m. and before 7:00 a.m. without getting written consent of the City Manager.

6.06 - Subcontracting of Contract Work:

Contract work amounting to not less than 25% of the original total contract price shall be performed by the Contractor's own organization. Subcontractors may perform any work item. The Contractor's own organization shall be construed to include only workers employed and paid directly by the Contractor and equipment owned or rented by the Contractor, with or without operators.

The Contractor shall not subcontract any portion of the contract, except furnishing of necessary material, without the written approval of the City. Approval of a subcontract shall not relieve the Contractor of the full responsibility for the performance of the contract. The Contractor shall not sell or assign any portion of the contract without the written consent of the City and the Contractors Surety.

Bonds furnished by the subcontractors shall not reduce the Contractor's bonding requirements.

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
PROJECT NO. P26-0010

No subcontract will be approved by the City unless a copy of the subcontract has been filed with the City. The Contractor remains fully responsible to the City for completion of the work according to the contract as if no portion of it had been subcontracted.

No subcontractor or supplier may maintain an action against the City for payment relating to goods or services provided in connection with the contract; any such action must be brought against the Contractor or the responsible party.

A subcontractor must perform 75% of the total value of the subcontracted work with the Subcontractor's own organization. This requirement is also applicable to and binding upon successive subcontractors.

The City Engineer may direct the immediate removal of any Subcontractor, or any Subcontractor's equipment being operated in violation of this section. Any costs or damages incurred are assumed by the Contractor.

6.07 - Permits:

Contractor shall obtain and pay for all pertinent construction permits and licenses, including but not limited to County Soil Erosion Permit, MDOT Permit, City Building Permits, Coast Guard, and Corps of Engineers Permits. The City will assist in obtaining permits and licenses when necessary.

6.08 - Laws, Regulations and City Ordinances:

The Contractor shall comply with all laws, regulations, and City Ordinances that apply to the performance of the work. The Engineer will not be responsible for monitoring the Contractors compliance with any laws, regulations, or ordinances.

6.09 - Royalties and Patents:

The Contractor shall pay for all royalties and patents and shall defend all suits or claims for infringements on any patent right for material, equipment, and/or processes used in the construction and shall save the City harmless from loss on account thereof.

6.10 - Taxes:

Contractor shall pay all applicable sales, consumer, City income and other similar taxes required to be paid in accordance with the applicable Federal, State, and Local Laws, Regulations and Ordinances of the City.

6.11 - Income Taxes:

The Contractor agrees to withhold City of Port Huron income tax for all employees paid for work or services rendered under this contract. The Contractor will remit such income taxes on a timely basis to the City of Port Huron. This agreement is consistent with the requirements set forth under the Uniform City Income Tax Ordinance, except any provisions limiting withholding requirement shall not apply to this contract.

Failure to withhold or remit shall be regarded as a breach for which the City may withhold 1% of the contract payments as liquidated damages. The Contractor further agrees to provide a list of subcontractors and proof of payment to subcontractors prior to final payment. Failure to comply with this provision shall be regarded as a breach for which the City may withhold 1% of the contract payments as liquidated damages.

6.12 - Use of Site and Other Areas:

Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the site and other areas permitted by laws and regulations, and shall not unreasonably encumber the site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the work.

Should any claim be made by any such owner or occupant because of the performance of the work, the Contractor shall promptly settle with such other party negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

6.13 - Utility Interruption:

In the event of interruption to utility services as a result of accidental breakage, the Contractor shall promptly notify the proper utility and cooperate with said utility in the restoration of services. Accidental interruption of utilities shall not deem a reason for an extension of time. If a water or sanitary service is accidentally severed and the City is called in by the Engineer to fix it, the Contractor will be charged for the City's time and materials to fix the break.

Sanitary and water service leads are the ownership of the landowner. The City will not mark the leads. Each lead must be reconnected by the end of the day. If a lead is damaged, the Contractor must repair it at their expense. The lead locations shown on the plans are for planning purposes only and do not reflect their correct location.

6.14 - Hauling on Local Streets:

Hauling on local streets will not be permitted unless given written authorization by the City Engineer.

6.15 - Removal of Excavated Materials:

All excess materials excavated during the progress of the work and not required for backfilling, all timber cut from the right-of-way, and any and all other materials which have been encountered and handled during the construction operation, and which constitute a disposable surplus during or at the end of the construction period shall belong to the Contractor unless the City requests this material in the bid documents. If the City requests such material, the material shall be hauled and neatly piled to the site, within the City boundary limits as specified.

6.16 - Salvaging Fire Hydrants, Catch Basin and Manhole Castings and Lids:

Surplus manholes, fire hydrants, catch basin castings, manhole castings, and lids shall belong to the City. The Contractor shall neatly stockpile the material as directed by the Engineer within the City limits.

6.17 - Safety and Protection:

The Contractor shall be solely responsible for initiating, maintaining and supervising all safety precaution and programs in connection with the Work. The Contractor shall take all necessary precautions for the safety and shall provide the necessary protection to prevent damage, injury, or loss to persons on the site who may be affected by: 1) the work and materials and equipment to be incorporated therein on the site; and 2) other property at the site adjacent thereto. The Contractor, before excavating, shall call MISS DIG at 811 or 1-(800) 482-7171, three days prior to excavating, excluding weekends and holidays. This requirement does not relieve the Contractor from notifying utilities not on the MISS DIG system.

6.18 - Safety Representative:

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

6.19 - Hazard Communication Programs:

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

6.20 - Survey Markers:

Any monument markers that are torn out of the ground by the Contractor before the surveyors witness them; will be the responsibility of the Contractor, as per the Special Provisions for “monument preservation.”

6.21 - Use of Explosives:

Use of explosives will not be permitted unless given written authorization by the City Engineer.

6.22 - Sanitary:

The Contractor shall provide for his employees an abundant and convenient supply of drinking water taken from the City mains or from some other safe and wholesome source and shall give orders against the use for drinking purposes of any water in the neighborhood known to be prejudicial to the health of employees.

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

6.23 - Drains:

The Contractor shall maintain in continuous and effective service all drains and watercourses touched during the progress of the work. If it becomes necessary in the prosecution of the work to interfere with, interrupt or obstruct the natural drainage of the surface, or the flow of the artificial drainage, the Contractor shall provide for same during the progress of the work in such manner that no damage will result either to the public or private interest; but no such interference with, interruption of or obstruction of drainage will be permitted without the written consent of the City Engineer. However, such consent shall in no manner relieve the Contractor from full responsibility for the consequences.

6.24 - Maintenance During Construction:

Routine maintenance is the repair of roads or bridges due to normal wear and tear of traffic and weather. Routine maintenance does not include damage done by the Contractor's vehicles or equipment. The City will do the snow plowing and ice control work. During periods of approved seasonal suspensions, the City will assume the routine maintenance.

No claim for additional compensation will be allowed for any inconvenience or delay caused by the Contractor as a result of routine maintenance operations performed by the City. When through traffic is maintained, the Contractor shall perform routine maintenance on that portion of the roadbed surface on which construction operations have begun.

The Contractor shall be responsible for, at the Contractor's expense, for routine maintenance on all temporary roads constructed by the Contractor. The Contractor shall provide, at the Contractor's expense, reasonable access for local traffic to property along the project.

The Contractor shall, at the Contractor's expense, make all repairs or renewals required for all damage to highway facilities which is not attributable to normal wear and tear of traffic and weather, but is due to defective materials, to faulty workmanship, to operations of the Contractor, or work not protected properly from natural causes.

6.25 - Traffic Control:

No road shall be closed to traffic unless directed by the Engineer.

Partial and full road closures must follow the MMUTCD.

Where construction interferes with the normal use of existing roads, temporary traffic facilities shall be provided and maintained. Facilities for local traffic, both pedestrians and vehicle access, shall be provided at all times for the adjacent property owners. For through traffic, the contract will designate

whether traffic will be maintained through all or a portion of the existing road or if traffic will be detoured.

Dust palliative shall be applied at the Engineer's request.

When the contract contains provisions for stage construction, the Contractor can request a change in the staging two weeks prior to the start. The Contractor shall not take action to implement the change until directed by the Engineer. If the proposed changes cost more, then those costs shall be borne by the Contractor.

If at any times during the construction the Engineer determines that traffic control devices are deficient, the Contractor will be notified immediately in writing to fix the deficiency. If the deficiency is not corrected, the Engineer may stop any of the affected work until corrective action is taken.

6.26 - Cleaning Site:

The Contractor shall at all times keep the premises free from accumulation of waste materials or rubbish caused by his employees or work.

6.27 - Water Shut Offs:

The Contractor must place fliers at each residence at least 24 hours prior to a known water shut-off. If the shut-off is determined to entail a larger area than what was intended, the Contractor must redistribute the fliers and wait 24 more hours for the intended shut-off. No water shut-off will be scheduled on a Friday or the day before a holiday without the Engineers approval. Once the water system is shut down but before the main is cut, the Contractor must confirm that no businesses are without water that were not notified. If there are businesses without water that were not notified then the main will not be cut. At the end of each day, the Contractor will be responsible to assure that business owners and residences have water.

Water service leads shown on the plans are approximate locations only. The water lead is the ownership of the landowner per City ordinance. During a MISS DIG call in, the known curb stop boxes will be marked only. The City does not mark the path the water service goes to the main or to the house. If this service is damaged during excavation, the Contractor will be liable to fix the service lead. If new grades are necessary during construction in the boulevard the curb stop boxes must be lowered flush with the new boulevard grade at the Contractor's expense.

6.28 - Street Sweepings:

Adjacent streets and streets open to traffic must be kept free from dust and dirt. A front end or back end broom will not be acceptable to clean the streets unless thoroughly watered down so no dust arises; a self-contained mechanical sweeper should be used for this purpose.

6.29 - Final Cleanup:

Before final acceptance of the work, the Contractor shall remove all false work, unused materials, erosion control devices, rubbish, approaches, buildings, machinery, equipment, and surplus material in

conjunction with the contract and the right-of-way restored in a neat and presentable condition satisfactory to the Engineer. Paved roadbeds shall be cleaned within 5 working days prior to opening

the pavement surface to traffic. Cleaning of roadbeds shall be performed in a manner that will not cause airborne dust.

Unless otherwise provided, full compensation for removal and disposal of materials for final clean will be considered as included in other items of work and no separate payment will be made.

6.30 - 24 Hour Call Number:

The Contractor shall give to the Engineer an emergency number where someone can be reached 24 hours a day. This person needs to be able to take care of problems within one hour which may arise during the construction while the Contractor is on the site or off the site. If the City takes care of the problem after 1 hour, the Contractor will be charged for the City's time and materials to correct the problem.

6.31 - Construction Safety Program:

The Contractor shall submit to the City an Emergency Site Plan which includes, but is not limited to outlining the Contractors plan for accident and fire prevention or mitigation on work to be done under the contract. 24-hour call numbers of key personnel in the Contractors organization shall also be submitted in case of an accident.

6.32 - Shop Drawings and Samples:

The Contractor shall submit shop drawings and/or samples to the Engineer for review and approval in accordance with the acceptable schedule and quantity of shop drawings and sample submittals agreed to at the pre-construction meeting. The data shown on the drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show the Engineer the materials. The material shall show intended use, fabrication, shipping, handling, storage, assembly, specified performance criteria, installation requirements, catalog numbers, installation pertaining to the performance of work and other pertinent information.

6.33 - Record Documents:

Contractor shall maintain in a safe place at the site one record copy of all drawings, specifications, addenda, written amendments, change orders, work change directives, field orders, and written interpretations and clarifications in good order and annotated to show changes made during construction.

These record documents together with all approved samples and a counterpart of all approved shop drawings will be available to the Engineer for reference. Upon completion of the work, these record documents, samples, shop drawings will be delivered to the Engineer.

Each submittal shall bear a stamp or specified written indication that the Contractor has satisfied the obligations of the Contract. If at the time of submittal there are any variances, the Contractor shall give

the Engineer specified notice of such variances. By submission of this variance does not constitute acceptance by the Engineer.

6.34 - Continuing the Work:

Contractor shall carry on the work and adhere to the progress schedule during all disputes or disagreements with the City. No work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by the *Contractor May Stop or Terminate* Section.

6.35 - Archeology and Historical Findings:

If the Contractor finds what appear to be items of potentially archaeological or historical significance (such as bones, artifacts, or buried foundations), the Contractor must immediately stop operations in that location and notify the Engineer. The Engineer will investigate and will direct the Contractor either to resume operations or to continue the suspension of operations, in accordance with subsection 9.02.

The Contractor must cooperate in the recovery of archeological and historical items, as directed by the Engineer. This work will be covered by an adjustment according to subsection 12.01, except there will be no payment for idled equipment that can be used elsewhere on the project. If appropriate, an extension of contract time will be granted.

6.36 - Contractor General Warranty and Guarantee:

Contractor warrants and guarantees to the City that all work will be completed in accordance with the Contract Documents, will be completed in a competent and workman-like manner and free from defects. Contractor's warranty and guaranty hereunder excludes defects or damages caused by: 1) abuse, modification, or improper maintenance or operation by persons other than the Contractor, Subcontractor, supplier or any other individual or entity for whom the Contractor is responsible; 2) or normal wear and tear under normal usage.

Contractor's obligation to perform and complete the work in accordance with the contract documents shall be absolute. None of the following constitute an acceptance of the work that is not in accordance with the contract documents or a release of Contractor's obligation to perform the work in accordance with the contract documents; 1) observations by Engineer, 2) recommendation by Engineer, 3) issuance of a certificate of substantial completion by the City Engineer, 4) use or occupancy of the work, 5) acceptance by City or any failure to do so, 6) any reviews and approval of a shop drawing or sample, 7) any inspection, test or approval by others and any 8) correction of defective work by the City.

6.37 - Indemnification:

To the fullest extent permitted by laws, regulation and City Ordinances, the Contractor shall indemnify and hold harmless the City, Engineer, Engineer's consultants and the officers, directors, partners, employees, agents, Council Members, and other consultants and subcontractor of each and any of them from and against all claims, costs, losses and damages (including but not limited to all fees and charges of Engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the work provided that any such claim, cost, loss, or damage:

- A. Is attributable to bodily injury, sickness, disease, death, or to injury to or destruction of tangible property (other than the work itself), including the loss of use resulting there from, and:
- B. Is caused in whole or in part by any negligent act or omission of Contractor, any subcontractor, any supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the work or anyone for whose acts any of them may be liable, regardless of whether or not caused in part by negligence or omission of an individual or entity indemnified hereunder or whether liability is imposed upon such indemnified party by laws, regulations, or City Ordinances regardless of the negligence of any such individual or entity.

In any and all claims against the City or Engineer or any of their respective consultants, agents, officers, directors, partners, Council Members, or employees by an employee (or the survivor or personal representative of such employee) of Contractor, any subcontractor, any supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the work, or anyone for whose acts any of them may be liable, the indemnification obligation as stated above shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the Contractor or any such subcontractor, supplier, or other individual or entity under worker's compensation acts, disability benefit acts, or other employee benefit acts.

The indemnification obligations of Contractor as stated above shall not extend to the liability of the Engineer and Engineer Consultants or to the officers, directors, partners, employees, agents, other consultants and subcontractor and Council Members, of each any of them arising out of: 1) preparation of approval of, or the failure to prepare or approve, maps, drawings, opinions, reports, surveys, change orders, designs, or specifications; or 2) giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

ARTICLE 7 - OTHER WORK

7.01 - Related Work at Site:

The City may perform other work related to the Project at the site by the City's employees, or let other direct contracts therefore, or have other work performed by utility owners. If such other work is not noted in the contract documents, then; 1) written notice thereof will be given to the Contractor prior to starting any such other work; and 2) if the City and the Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustments in the contract price or contract times, that should be allowed as a result of such other work, a claim may be made.

Contractor shall afford each other entity who is to perform work at the project a proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work and shall properly coordinate the work with others.

Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of the Engineer and the others whose work

will be affected. If the proper execution or results of any part of Contractor's work depends upon work performed by others under this article, the Contractor shall inspect such other work and promptly report to the Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with the Contractor's work except for latent defects and deficiencies in such other work.

7.02 - Coordination:

If the City intends to contract with others for performance of other work on the project at the site, the following will be set in the Supplementary Conditions; 1) individual or entity who will have authority and responsibility for coordination of the activities among the various Contractors will be identified; 2) specific matters to be covered by such authority and responsibility will be itemized; and 3) the extent of such authority and responsibility will be provided.

ARTICLE 8 - CITY'S RESPONSIBILITIES

8.01 - Communication:

Except as otherwise provided in these General Conditions, the City shall issue all communications to the Contractor through the Engineer.

8.02 - Replacement of Engineer:

In case of termination of the employment of the Engineer, the City shall appoint an Engineer whose status under the contract documents shall be that of the former Engineer.

8.03 - Furnish Data:

The City shall promptly furnish the data required of the Owner under the contract documents.

8.04 - Pay Promptly When Due:

The City shall make payments to the Contractor promptly when they are due, as set forth in the contract documents.

8.05 - Lands, Easements, Reports and Tests:

The City's duties in respect to providing lands, easements, reports, tests and providing engineering surveys to establish reference points are set forth in the contract documents.

8.06 - Insurance:

The City's responsibilities, if any, in respect to purchasing and maintaining liability and property insurance are set forth in these contract documents.

8.07 - Change Orders:

The City is obligated to execute change orders as indicated in these contract documents.

8.08 - Survey Staking, Inspections and Approvals:

The City's responsibilities in respect to certain inspections, survey staking, test and approvals is set forth in these contract documents.

8.09 - Limitations on Owners Responsibilities:

The City shall not supervise, direct or have control or authority over, nor be responsible for the Contractor's means, methods, techniques sequences or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with laws and regulations applicable to the performance of the work. City will not be responsible for Contractor's failure to perform the work in accordance with the contract documents.

8.10 - Undisclosed Hazardous Environmental Condition:

The City's responsibility in respect to undisclosed hazardous environmental condition is set forth in these contract documents.

8.11 - Use of City Water Supply:

Hydrants and valves shall be opened and closed by City Utility personnel only. Contractors desiring to use water from the City water mains, by public hydrants or otherwise, will be required to make application to the Water Department and conform to the rules and regulations provided in such cases by City Ordinance, and Rules of the Department.

If the Contractor uses a fire hydrant, a registered and tested reduced pressure zone valve system must be used. Water shall be paid for on the basis of the estimated quantity used at the current commodity rate.

If a permitted hydrant is being used to fill and/or flush a hydrant no payment for the water is required. If the water is being used for any other purpose, the going rate for the water will be estimated and charged to the Contractor.

8.12 - Materials:

The City has a limited inventory of materials in stock to use during its repairs. The City will not furnish the Contractor with any materials or supplies or transportation required for the contract or extra work without the expressed written order from the City Engineer. The Contractor is required to have on hand a vast array of materials so the Contractor can fix any and all water and/or sanitary services or mains if they break.

8.13 - Surveys:

The City shall furnish all surveys and provide stakes for line and grade. If, the Contractor removes the stakes and a re-stake is required, the Contractor will be required to pay for the cost of the re-staking.

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

9.01 - General Authority of the Engineer:

The Engineer will decide all questions which may arise to the interpretation of the plans and specifications, and all questions as to the satisfactory and acceptable fulfillment of the terms of the contract by the Contractor.

The Engineer will also decide all questions, which may arise as to the quality and acceptability of the materials furnished, work performed, manner of performance and rate of progress of the work. The Engineer will clarify and decide as to the true intent of the plans and specifications when an inconsistency, omission, conflict or uncertainty is discovered.

The Engineer shall not supervise, direct or have control or authority over, nor responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of the Contractor to comply with laws and regulations applicable to the performance of the work. Engineer will not be responsible for the Contractor's failure to perform the work in accordance with the contract documents.

9.02 - Engineer's Authority to Suspend Work:

The Engineer will have the authority to suspend the work wholly or in part, for period(s) deemed necessary. Work may be suspended due to unsuitable weather or other conditions as are considered unfavorable for the prosecution of the work or for all other conditions or reasons deemed to be in the interest of the public. The Engineer shall not suspend work without written notice to the Contractor.

Upon suspension, the work shall be put in satisfactory condition, covered and protected. The work shall not be resumed until permitted by written order of the Engineer.

If the performance of all or any portion of the work is suspended or delayed by the Engineer in writing for a period of time not originally anticipated, customary or inherent to the construction industry and the Contractor believes that additional compensation or contract time is due as a result of such suspension or delay, the Contractor can file an intent to claim as outlined in the contract documents.

No contract adjustment will be allowed under this clause to the extent that performance would have been suspended or delayed by any other cause, or for which an adjustment is provided for or excluded under any other term or condition of this contract.

The Engineer shall have the authority to reject all work and materials which do not conform to the contract specifications.

9.03 - Authority and Duties of Resident Project Representatives:

The City and its authorized representatives shall have access to all parts of the work at all times and shall be furnished such information and assistance by the Contractor as may be required to make complete and detailed observations. These observations may also occur at a mill, plant, laboratory or shop. Claims by the Contractor for delays or inconveniences due to these operations will not be considered. Resident Project Representatives may be appointed to inspect materials used and work done. Inspection may extend to all parts of the work and preparation or manufacture of materials for use in the work. Resident Project Representatives are not authorized to revoke or change the specifications or plans. If a dispute arises between the contractor and the Resident Project Representative as to the materials furnished or performance of the work, the Resident Project Representative shall have the authority to reject materials or suspend the work until the dispute is decided by the Engineer.

Work done contrary to the Resident Project Representatives directions or while suspended by the Resident Project Representative will be considered unauthorized and may have to be removed and replaced at the Contractor's expense. In no instance will any action or omission on the part of the Resident Project Representative relieve the Contractor of the responsibility of completing the work according to the plans and specifications.

ARTICLE 10 - CHANGES IN THE WORK

10.01 - Authorized Changes in the Work:

Without invalidating the agreement and without notice to any surety, owner may, at any time or from time to time, order additions, deletions, or revisions in the work by a written amendment, a change order, or a work change directive. Upon receipt of any such document, Contractor shall promptly proceed with the work involved which will be performed under the applicable conditions of the contract documents (except as otherwise specifically provided).

If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the contract price or contract times, or both, that should be allowed as a result of a work change directive, may make a claim as stipulated in the contract documents.

10.02 - Unauthorized Changes in the Work:

Contractor shall not be entitled to an increase in the contract price or an extension of the contract times with respect to any work performed that is not required by the contract documents as amended, modified, or supplemented as provided in these contract documents, except in the case of an emergency as provided in these contract documents or in the case of uncovering work as provided in these contract documents.

10.03 - Execution of Change Orders:

Owner and Contractor shall execute appropriate change orders recommended by Engineer (or written amendments) covering:

- A. Changes in the work which are: (i) ordered by Engineer as provided in these contract documents, (ii) required because of acceptance of defective work as provided in these contract documents or Owner's correction of defective work under these contract documents, or (iii) agreed to by the parties;
- B. Changes in the contract price or contract times which are agreed to by the parties, including any undisputed sum or amount of time for work actually performed in accordance with a work change directive; and
- C. Changes in the contract price or contract times which embody the substance of any written decision rendered by City Engineer; provided that, in lieu of executing any such change order, an appeal may be taken from any such decision in accordance with the provisions of the contract documents and applicable laws and regulations, but during any such appeal, Contractor shall carry on the work and adhere to the progress schedule.

10.04 - Notification of Surety:

If notice of any change affecting the general scope of the work or the provisions of the contract documents (including, but not limited to, contract price or contract times) is required by the provisions of any bond to be given to a surety, the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 - Claims and Disputes:

Claims and disputes will be handled under subsection 4.04, Resolving Discrepancies. Neither party shall be entitled to make a claim for or receive any loss of anticipated profit, consequential damages, including loss of bonding capacity, loss of bidding opportunities, insolvency, and the effects of force account work on other projects, or business interruption, attorney fees, claim preparation expenses, and the costs of litigation.

In the event after the bid is submitted, the Contractor becomes aware of or receives any information from the Owner or from any other source which might impact the amount of the Contractor's bid or result in claims, the Contractor shall promptly notify the Owner of the potential for such impacts and, to the extent possible, the Contractor shall quantify the potential impact on the Contractor's bid. Thereafter, the parties shall meet and attempt to agree on whether the newly discovered information shall impact on the Contractor's bid and, if so, how the potential claims shall be tracked and quantified. If the Contractor fails to follow this procedure then any potential claims by the Contractor as a result of the newly received or discovered information are waived.

ARTICLE 11 - COST OF THE WORK, CASH ALLOWANCES and UNIT PRICE WORK

11.01 - Cost of Work:

- A. Costs Included: The term cost of the work means the sum of all costs necessarily incurred and paid by Contractor in the proper performance of the work. When the value of any work covered by a change order or when a claim for an adjustment in contract price is determined on the basis of cost of the work, the costs to be reimbursed to Contractor will be only those additional or

incremental costs required because of the change in the work or because of the event giving rise to the claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the project, shall include only the following items, and shall not include any of the costs itemized in paragraph 11.01.B.

1. Payroll costs for employees in the direct employ of Contractor in the performance of the work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include without limitation superintendents, foremen, and other personnel employed full time at the site. Payroll costs for employees not employed full time on the work shall be apportioned on the basis of their time spent on the work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing work outside of regular hours, on Saturday, Sunday, or legal holidays, shall not be included in the above except to the extent pre-authorized by Owner.
2. Cost of all materials and equipment furnished and incorporated in the work, including costs of transportation and storage thereof, and suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposited funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner.

All trade discounts, rebates and refunds and return from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors of work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors accept to Owner and Contractor and shall deliver such bids to Owner, who will then determine with the advice of Engineer which bids, if any, will be acceptable.

If any subcontract provides that the Subcontractor is to be paid on the basis of cost of the work, plus a fee, the Subcontractor's cost of the work and fee shall be determined in the same manner as Contractor's cost of the work and fee as provided in this paragraph 11.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the work.
5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the work.

- b. Cost, including transportation and maintenance of all materials, supplies, equipment, machinery, appliances, supplies, equipment, facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the work, and cost, less market value, of such items used but not consumed which remain at the property of Contractor.
- c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or other in accordance with the rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment machinery, or parts shall cease when the use no longer necessary for the work.
- d. Sales, consumer, use, and other similar taxes related to the work, and for which Contractor is liable, imposed by the laws and regulations.
- e. Deposited lost for causes other than negligence of Contractor, any subcontractor, or anyone directed or indirectly employees by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- f. Losses and damages (and related expenses) caused by damage to the work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the work (except losses and damages within the deductible amounts of property insurance established in accordance with paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written damages, and expenses shall be included in the cost of the work for the purpose of determining Contractor's fee.
- g. The cost of utilities, fuel, and sanitary facilities at the site.
- h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage, and similar petty cash items in connection with the work.
- i. When the cost of the work is used to determine the value of a change order or of a claim, the cost of premiums for additional bonds and insurance required because of the changes in the work or caused by the event giving rise to the claim.
- j. When all the work is performed on the basis of cost-plus, the costs of premiums for all bonds and insurance Contractor is required by the contract documents to purchase and maintain.

B. Cost Excluded: The term cost of the work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals, (or partnerships and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the site or in Contractor's principal or branch office for general administration of the work and not specifically included in the agreed upon schedule of job classifications referred to in paragraph 11.01.A.1 or specifically covered by paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.
2. Expenses of Contractor's principal and branch offices other than Contractor's office at the site.
3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
4. Costs due to the negligence of Contractor, any subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraph 11.01.A and 11.01.B.

C. Contractor's Fee: When all the work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the agreement. When the value of any work covered by a change order or when a claim for an adjustment in contract price is determined on the basis of cost of the work, Contractor's fee shall be determined as set forth in paragraph 12.01.C.

D. Documentation: Whenever the cost of the work for any purpose is to be determined pursuant to paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 - Cash Allowances:

It is understood that Contractor has included in the contract price all allowances so named in the contract documents and shall cause the work so covered to be performed for such sums as may be acceptable to Owner and Engineer. Contractor agrees that:

- A. The allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the site, and all applicable taxes; and
- B. Contractor's costs for unloading and handling on the site, labor, installation costs, overhead, profit, and other expenses contemplated for the allowances have been included

in the contract price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

Prior to final payment, an appropriate change order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of work covered by allowances and the contract price shall be correspondingly adjusted.

11.03 - Unit Price Work:

- A. Where the contract documents provided that all or part of the work is to be unit price work, initially, the contract price will be deemed to include for all unit price work an amount equal to the sum of the unit price for each separately identified item of unit price work times the estimated quantity of each item as indicated in the agreement.
- B. The estimated quantities of items of unit price work are not guaranteed and are solely for the purpose of comparison of bids and determining an initial contract price. Determinations of the actual quantities and classifications of unit price work performed by Contractor will be made by Engineer subject to the provisions of these contract documents.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Owner or Contractor may make a claim for an adjustment in the contract price in accordance with these contract documents:
 - 1. The quantity of any item of unit price work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the agreement; and
 - 2. There is no corresponding adjustment with respect to any other item of work; and
 - 3. If Contractor believes that Contractor is entitled to an increase in contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in contract price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 - CHANGES OF THE CONTRACT PRICE AND TIMES

12.01 - Adjustments:

An adjustment will be made when there is a written change order or by written amendment to the contract made by the City Engineer as a result of the Contractor filing a claim using one of the following three (3) methods.

- A. Where the work involved is covered by unit prices contained in the contract documents by application of such unit prices to the quantities of the items involved; or

- B. Where the work involved is covered by unit prices for major items of work contained in the contract documents by a mutually agreed lump sum (which may include an allowance for overhead and profits not necessarily in accordance with the stipulations below); or
- C. Where the work involved is not covered by unit prices contained in the contract documents and agreement to a lump sum is not reached on the basis of the cost of the work, the following force account method will apply.

12.02 - Force Account:

The adjustments shall be the costs, as described below for the labor, equipment and materials used to complete the work incurred as a result of a differing site condition. Down time will not be paid on claims of less than 1 hour per day or after the normal end of the regular shift. payment for the work will be on the following basis:

- A. Labor - The cost for labor shall be the reasonable cost calculated as follows: foreman and laborers will receive the rate of wages as determined by what they were receiving before the adjustment started. This rate will be paid for the time that the laborers and foreman are engaged in the work.

This will include hours required by a collective bargaining agreement or other employment contract applicable to the class of labor employed on the work, exclusive of time included in the "estimated operating costs."

The Contractor will receive the cost paid to, or in behalf of workers for vacation benefits, health and welfare benefits, pension fund benefits or other benefits when the amounts are required by a collective bargaining agreement or other employment Contract generally applicable to the classes of labor employed on the work.

The superintendent's compensation will not be included in this payment. A 15% markup can be included.

- B. Bonds, Insurance and Tax-Bond premium, workmen's compensation insurance, personal injury, public liability and property damage, public liability insurance, unemployment compensation and Federal Social Security levied against the Contractor will be paid at cost. Single business tax will not be paid for. The Contractor shall furnish satisfactory evidence of the amounts paid for each of the required costs as related to the adjustment. No additional add-ons will be permitted.
- C. Materials - The cost for materials shall be the reasonable cost of materials used by the Contractor to perform the work as reflected in the originally receipted bills for the materials used and the freight charges paid on the materials. A discount for prompt payment or penalty for late payment will not be considered in determining the net amount of the bill. Where materials used are not specifically purchased for use on this work but are taken from the Contractor's stock, the Contractor shall submit a certification of the

quantity, price and freight on the material in lieu of original bills and invoices. A 15% markup will be allowed.

- D. Equipment - For equipment other than small tools, the use of which is approved by the Engineer, the Contractor will be paid as follows:

The equipment rates include the cost of fuel, oil, lubrication, supplies, necessary attachments, repairs, overhaul and maintenance of any kind of depreciation, storage, overhead, profits and all incidentals. The rates also include the cost of insurance covering the usual insurable risks, including fire and theft. The City will not be liable for losses that can be covered by insurance. The City will not pay for more than eight hours in one day for down time equipment.

Upon request, the Contractor shall furnish to the Engineer either original bills and invoices or certification documenting the equipment's original invoice price plus improvements. The City will not pay for equipment cost over the equipment's original invoice cost plus any document improvements on a total project basis.

For Contractor owned equipment, the rental rate established for each piece used, including appurtenances and attachments to equipment, will be determined by using the *Rental Rate Blue Book for Construction Equipment*, Volume 1, 2, or 3, by Dataquest, Inc.

The edition that is current at the time the force account work is started will apply. The established base hourly rental rate will be equal to the monthly rate divided by 176, modified by the rate adjustment factor and the applicable map adjustment factor, plus the "estimated operating costs per hour." For idled equipment, no operating costs listed in the Blue Book will be allowed.

For equipment not listed in the Blue Book, the rental rate will be determined by using the rate listed for a similar piece of equipment in which the capacity, size, horsepower and age are properly considered. Equipment for which there is no comparable cost in the Blue Book, the monthly rate shall be reasonable but not more than 5 percent of the invoiced cost of the equipment.

The base hourly rate shall then be determined by dividing the monthly rate by 176. Rates shall be agreed upon in writing before the equipment is used.

No payment will be allowed for small hand and power tools that are not listed in the Blue Book. Small hand and power tools listed in the Blue Book at a rate of less than \$1.00 per hour will be considered as part of overhead and will not be paid for separately. The rates used for Contractor owned trucks used to haul material shall be in accordance with blue book rates. Separate payment for the driver will be allowed. The rental rate for the foreman's transportation unit will be \$10.00 per hour, including fuel.

The time charged per day for equipment used productively in force account work will be the time required to do the work. For equipment which is required intermittently, the rental time will be determined after the equipment is first used while work is being performed on the Force Account activity and the equipment is needed. The rental rate for intermittently used equipment will be at the full rate or stand by rate depending upon the productive use or non-use of the equipment.

In addition, the payment will include traveling time to the location of the work when the equipment is moved under its own power within the project limits. When transportation from one site to another is by other than its own power, the actual operating time during period of loading and unloading will be paid for at the regular rental rate and transportation costs will be allowed.

Transportation charges for each piece of equipment to and from the work site will be paid provided:

1. Equipment is obtained from the nearest available source;
2. Return charges do not exceed the delivery charges;
3. Charges are restricted to those units of equipment not already available and not on or near the project.

The above provisions apply to the equipment and plant owned directly by the Contractor or by entities that are divisions, affiliates, subsidiaries or any other way related to the Contractor or parent company.

The standby rate will only be allowed if both of the following conditions are met:

1. The Engineer specifically required the equipment to remain on the site for later use on the Force Account activity; and
2. Work is being performed on the Force Account activity when the equipment is idle. For Contractor owned equipment, the payment will be made at one-half the rate established above. No payment will be allowed for operating cost. Payments for standby time will not be made on any day the equipment operates for 8 or more hours. For equipment accumulating less than 8 hours operating time on any normal work day, standby payments will be limited to only that number of hours that, when added to the operating time for that day, equals 8 hours.

If the Contractor is required to rent specific type of equipment, the Contractor shall inform the Engineer of the need to rent the equipment and of the rental rate for that equipment before using it on the work site. The Contractor will be paid for the actual rental for the equipment for the time that the equipment is used to accomplish the work, plus the cost of moving the equipment on and away from the job, provided the total rental rate does not exceed the rental rate established by the Blue Book plus operating costs. The Contractor shall provide a copy of invoices for all rental expenses.

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For all of the above, the payable time does not include elapsed time while the equipment is broken down or the time elapsed after the Engineer has advised the Contractor the equipment is no longer needed, except for transportation cost.

- E. Subcontracting or Hiring Services by Others. For administration costs in connection with subcontract work or hiring of services provided by others to perform specialized type work which the Contractor is not qualified to do, the Contractor shall receive an amount equal to five percent (5%) of the total cost of the work computed as set forth above. Prior approval by the Engineer is required.

12.03 - Additional Contract Time:

The Contractor may request, or the parties may agree to extension of Contract times in writing. Any agreed upon changes in Contract times agreed upon by the parties shall be by a written amendment or change order and shall be signed by both parties authorized representative. In the case of the City, the authorized representative shall be the City Engineer. If the Contractor is requesting an extension of time under the Contract, the Contractor must submit a written request for a change order which states the reason for the request along with any supporting documentation. If the Contractor is granted an extension, it must be in writing signed by the City Engineer. The decision of the City Engineer as to the extension of time shall be final and binding.

12.04 - Liquidated Damages:

Liquidated damages will be charged to the Contractor if no additional time is given to the Contractor at the rate the City is damaged by the contract not being done on time. This includes consultant's inspection time, City's inspection time and other costs associated due to the project not being finished on time. The amount per day will be evaluated before the bid of the contract and will be listed in the Supplementary General Conditions. This number is a baseline and if substantiated this number could change according to the damages suffered by the City. This is not meant to be a penalty.

12.05 - Default of Contract:

- A. Notice of Default. If the Contractor is responsible for any of the following, the Engineer may give the Contractor and Surety written notice of default and the action required to be taken by the Contractor and Surety:
1. Failing to prosecute the work with the labor, equipment, or materials sufficient to complete the work within the contract time and according to the progress schedule;
 2. Performing the work improperly;
 3. Neglecting or refusing to remove material or to reconstruct work that has been rejected as defective and unsuitable; or
 4. Failing to perform the work as required by the contract for any other reason.
- B. Owner Completion of Work. If any of the following occurs, the City will have full power and authority to take the work out of the hands of the Contractor and Surety, including appropriation and use of any materials on the project, and use of a contract or any other method that the City determines may be necessary to complete the work:
1. The Contractor or Surety, within a period of 10 days after the notice of default, does not proceed in a manner that is reasonably satisfactory to the Owner.
 2. The Contractor becomes insolvent or is declared bankrupt.
 3. A court judgment is entered against the Contractor which is not satisfied within 21 days of entry which could jeopardize the continued operation of the Contractor.
 4. The Contractor makes an assignment for the benefit of the Contractor's creditors.
 5. The Contractor files proceedings for reorganization in accordance with the Bankruptcy Act, or such proceedings are filed against the Contractor.

If the Owner takes over the uncompleted work, the Owner will deduct all additional costs and damages, and the costs and charges of completing the same, from monies due or to become due the Contractor. If the total of the damages, costs, and charges exceeds the balance of the contract amount that would have been payable to the Contractor had the Contractor completed the work, the Contractor and Surety must pay the amount of the overage to the Owner upon request.

12.06 - Termination of Contract:

If the Owner determines that termination is in the City's best interest, the Owner may terminate the contract or any portion of the contract. If the Owner orders termination of a contract effective on a certain date, the Owner will pay the Contractor for completed or partially completed work as of that date at the contract unit prices or on a force account basis, as determined by the Engineer. If the Owner terminates a portion of the contract, the Owner may stop delivery and payment for materials made unnecessary. The Owner will pay for pay items eliminated in their entirety by the termination in accordance with subsection 103.02.F of the Michigan Department of Transportation's 2020 Standard Specifications for Construction.

The Owner may choose to purchase from the Contractor acceptable materials obtained for the work but not used at actual cost delivered to a prescribed location plus 15 percent, or otherwise disposed of as mutually agreed. The Contractor must submit any claim for additional compensation not covered in the

contract within 60 days after the effective termination date, or as otherwise authorized by the Owner. The Contractor must make records available to support the validity and amount of anticipated profits due to the Owner's termination of the contract or any portion of the contract.

The Owner's decision to terminate the contract or a portion of the contract will neither relieve the Contractor of its contractual responsibilities for the completed work, nor will it relieve the Surety of its obligation for any claim arising out of the work performed.

- A. Reasons for Termination. The Owner may terminate the contract after determining that, for reasons beyond either the Owner's or the Contractor's control, the Contractor is prevented from proceeding with or completing the contract work. Reasons for termination may include, but are not limited to, the following:
1. Executive orders by the President of the United States relating to war or national defense.
 2. A national emergency that creates a serious shortage of materials.
 3. Orders from duly constituted authorities relating to energy conservation, preservation of archaeological and historical findings, funding problems, or a change in project priorities.
 4. Restraining orders or injunctions obtained by third-party citizen action resulting from national or local environmental protection laws, or where the issuance of the order or injunction is primarily caused by acts or omissions of persons or agencies other than the Contractor.
 5. A differing site condition or altered character of work amounting to significant additional contract costs.
- B. Immediate Obligations. The Engineer will deliver a Notice of Termination to the Contractor that specifies the extent of termination and the effective date. After receipt of a Notice of Termination, the Contractor must immediately proceed with the following obligations:
1. Stop work as specified in the notice.
 2. Place no further subcontracts or orders for materials, services, or facilities, except as necessary to complete the remaining portion of the contract.
 3. Terminate all subcontracts to the extent they relate to the work terminated.
 4. Transfer title and deliver to the Owner the following:
 - a. For the fabricated, partially fabricated, or unfabricated parts, all work in progress, completed work, supplies and other material produced or acquired for the terminated work, and
 - b. The completed or partially completed plans, drawings, information, and other property that, if the contract had been completed, the Contractor would have been required to provide to the Owner.
 5. Complete the performance of the non-terminated work.
 6. With the Engineer, on a date identified by the Engineer, take inventory of acceptable materials obtained for the project that has not been incorporated into the work.
 7. Take any action necessary, or directed by the Engineer, for the protection and preservation of the property related to the contract that is in the possession of the Contractor and in which the Owner has or may acquire an interest.

ARTICLE 13 - TESTS AND INSPECTIONS, CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK:

13.01 - Notice of Defects:

Prompt notice of all defective Work of which the Engineer has actual knowledge of will be given to Contractor. All defective work will be rejected, corrected or accepted.

13.02 - Access to Work:

Engineer, Engineer's Consultants, other representatives of the City, independent testing laboratories and governmental agencies with jurisdictional interests will have access to the work at reasonable times for their observation and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's site safety procedures and programs so that they may comply therewith as applicable.

13.03 - Tests and Inspections:

- A. Contractor shall give Engineer timely notice of readiness of the work for all required inspections, tests, or approvals, and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. City shall employ and pay for the services of an independent testing laboratory to perform inspections, tests, or approvals required by the contract documents except:
 - 1. that costs incurred in connection with tests or inspections conducted pursuant to paragraph 13.04 below shall be paid as provided in said paragraph 13.04; and
 - 2. as otherwise specifically provided in the contract documents.
 - 3. If laws or regulations of any public body having jurisdiction require any work (or part thereof) specifically to be inspected, tested or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection, or approval.
 - 4. Contractor shall also be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the work, or of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the work.
- C. If any work (or the work of others) that is to be inspected, tests or approved is covered by Contractor without written concurrence of Engineer, it must, if requested by Engineer, be uncovered for observation.

- D. Uncovering work as provided in the paragraph above shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 - Uncovering Work:

- A. If any work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.
- B. If Engineer considers it necessary or advisable that covered work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request shall uncover, expose, or otherwise make available for observation, inspection or testing as Engineer may require, that portion of the work in question, furnishing all necessary labor, material and equipment.
- C. If it is found that such work is defective, Contractor shall pay all costs and damages caused by, arising out of, or resulting from such uncovering, exposure, observation, inspection and testing and of satisfactory replacement or reconstruction, (including but not limited to fees and charges of engineers, architects, attorneys and other professionals, all court or arbitration or other dispute resolution costs, and all costs of repair or replacement of work of others), and Owner shall be entitled to an appropriate decrease in the contract price, and, if the parties are unable to agree as to the amount thereof, may make a claim.
- D. If, however, such work is not found to be defective, Contractor shall be allowed an increase in the contract price or an extension of the contract times, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement and reconstruction; and, if the parties are unable to agree as to the amount of extent thereof, Contractor may file a claim.

13.05 - Owner May Stop the Work:

If the work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to furnish or perform the Work in such a way that the completed Work will conform to the contract documents, Owner may order Contractor to stop the work, or any portion thereof, until the cause for such order has been eliminated.

13.06 - Correction or Removal of Defective Work:

If required by Engineer, Contractor shall promptly, as directed, either correct all defective work, whether or not fabricated, installed or completed or, if the work has been rejected by Engineer, remove it from the site and replace it with work that is not defective.

Contractor shall pay all costs and damages caused by or resulting from such correction or removal (including but not limited to fees and charges of engineers, architects, attorneys and other professionals, all court or arbitration or other dispute resolution costs, and all costs of repair or replacement of work of others).

13.07 - Correction Period:

- A. Upon the discovery of defective work and for such period of time as may be prescribed by Laws and Regulations or by the terms of any applicable special guarantee required by the contract documents any work is found to be defective, Contractor shall promptly, without cost to City and in accordance with Engineer's written instructions: (I) correct such defective work, or, if it has been rejected by Engineer, remove it from the site and replace it with work that is not defective, and (ii) satisfactorily correct or remove and replace any damage to other work or the work of others resulting there from.
- B. If Contractor does not promptly comply with the terms of such instructions, or in any emergency where delay would cause serious risk of loss or damage, City may have the defective work corrected or the rejected work removed and replaced, and all direct, indirect and consequential costs and damages caused by or resulting from such removal and replacement (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals or court, or arbitration or other dispute resolution costs and all costs of repair or replacement of work by others) will be paid by Contractor.

13.08 - Acceptance of Defective Work:

If, instead of requiring correction or removal and replacement of defective work, City (and, prior to Engineer's recommendation of final payment,) prefers to accept it, City may do so. Contractor shall pay all costs attributable to Owner's evaluation of and determination to accept such defective work (such costs to be approved by Engineer as to reasonableness and to include but not limited to all fees and charges of engineers, architects, attorneys and other professionals, or court, or arbitrator or other dispute resolution costs).

If any such acceptance occurs prior to Engineer's recommendation of final payment, a change order will be issued incorporating the necessary revisions in the contract documents with respect to the work; and City shall be entitled to an appropriate decrease in the contract price, and, if the parties are unable to agree as to the amount thereof, Contractor may make a claim. If the acceptance occurs after such recommendations, an appropriate amount will be paid by Contractor to City.

13.09 - Owner May Correct Defective Work:

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective work or to remove and replace rejected work as required by Engineer in accordance with paragraph 13.06, or if Contractor fails to perform the work in accordance with the contract documents, or if Contractor fails to comply with any other provision of the contract documents, City may, after seven days written notice to Contractor, correct and remedy any such deficiency.
- B. In exercising the rights and in connection with such corrective and remedial action, City may exclude Contractor from all or part of the site, take possession of all or part of the work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the site and incorporate in the work all materials and equipment stored at the site or for which Owner has paid Contractor but which are stored elsewhere.

- C. Contractor shall allow City, City's representatives, agents and employees, City's other contractors and Engineer and Engineer's Consultants such access to the site as may be necessary to enable City to exercise the rights and remedies under this paragraph. All costs and damages incurred or sustained by City in exercising such rights and remedies will be charged against Contractor and a change order will be issued incorporating the necessary revisions in the contract documents with respect to the work; and City shall be entitled to an appropriated decrease in the contract price. Such costs and damages will include but not be limited to all fees and charges of engineers, architects, attorneys and other professionals, all court, or arbitration or other dispute resolution or damaged by correction, removal or replacement of Contractor's defective work.
- D. Contractor shall not be allowed an extension of the contract times (or milestones) because of any delay in the performance of the work attributable to the exercise by City of City's rights and remedies hereunder.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 - Schedules of Values:

The schedule of values established will serve as the basis for progress payments and will be incorporated into a form of application for payment acceptable to Engineer. Progress payments on account of unit price work will be based on the number of individual units completed or a proportion of a single unit unless otherwise called for in the specifications.

14.02 - Application for Progress Payment:

The days established for the submittals of each progress payment will be set up at the preconstruction meeting. Contractor shall submit to Engineer for review an application for payment filled out and signed by Contractor covering the work completed as of the date of the application and accompanied by such supporting documentation as is required by the contract documents. Stock piled materials will not be paid for unless specifically agreed upon by the Engineer once the Contractor files a claim.

14.03 - Contractor's Warranty of Title:

Contractor warrants and guarantees that title to all work, materials and equipment covered by application for payment, whether incorporated in the project or not, will pass to City no later than the time of payment free and clear of all liens.

14.04 - Review of Applications for Progress Payment:

- A. Engineer will, within ten days after receipt of each application for payment, either indicate in writing a recommendation of payment and present the application to City, or return the application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the payment with the Engineer's recommendation, the amount recommended will (subject to the provisions of the last sentence of paragraph 14.04.C) become due and when due will be paid by City to Contractor.

- B. Engineer's recommendation of any payment requested in an application for payment will constitute a representation by Engineer to City, based on Engineer's on-site observations of the executed work as an experienced and qualified design professional and on Engineer's review of the application for payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
1. The work has progressed to the point indicated.
 2. The quality of the work is generally in accordance with the contract documents (subject to an evaluation of the work as a functioning whole prior to or upon substantial completion, to the results of any subsequent tests called for in the contract documents, to a final determination of quantities and classifications for unit price work, and to any other qualifications stated in the recommendation), and
 3. The conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the work.
- C. However, by recommending any such payment Engineer will not thereby be deemed to have represented that: (i) exhaustive or continuous on-site inspections have been made to check the quality or the quantity of the work beyond the responsibilities specifically assigned to Engineer in the contract documents or (ii) that there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by City or entitle City to withhold payment to Contractor.
- D. Engineer's recommendation of any payment, including final payment shall not mean that Engineer is responsible for Contractor's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with laws and regulations applicable to the furnishing or performance of work, or for any failure of Contractor to perform or furnish work in accordance with the contract documents.
- E. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representation to City referred to in paragraph 14.04.A. Engineer may also refuse to recommend any such payment or because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended, to such extent as may be necessary in Engineer's opinion to protect City from loss because:
- a. The work is defective, or completed work has been damaged requiring correction or replacement.
 - b. The contract price has been reduced by written amendment or change order.
 - c. Owner has been required to correct defective work or complete work in accordance with paragraph 13.09, or

- d. Engineer has actual knowledge of the occurrence of any of the events enumerated in paragraph 15.02.A through 15.02.D inclusive.
- F. City may refuse to make payment of the full amount recommended by Engineer because:
 - 1. Claims have been made against City on account of Contractor's performance or furnishing of the work.
 - 2. Liens have been filed in connection with the work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such liens.
 - 3. There are other items entitling City to a set-off against the amount recommended, or
 - 4. Engineer has actual knowledge of the occurrence of any of the events enumerated in paragraphs 14.04.C.a. through 14.04.C.c. or paragraphs 15.02.A through 15.02.D inclusive; but Engineer must give Contractor immediate written notice stating the reasons for such action and promptly pay Contractor the amount so withheld or any adjustment thereto agreed to by City and Contractor, when Contractor corrects to Engineer's satisfaction for reasons for such action.

14.05 - Substantial Completion:

- A. When Contractor considers the entire work ready for its intended use Contractor shall notify Engineer in writing that the entire work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that City Engineer issue a certificate of substantial completion.
- B. Within a reasonable time thereafter, Owner, Contractor and Engineer shall make an inspection of the work to determine the status of completion.
- C. If Engineer does not consider the work substantially complete, Engineer will notify Contractor in writing giving the reasons therefore. If Engineer considers the work substantially complete, City Engineer will prepare and deliver to Contractor a certificate of substantial completion which shall fix the date of substantial completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment.
- D. City shall have the right to exclude Contractor from the work after the date of substantial completion, but City shall allow Contractor reasonable access to complete or correct items on the tentative list.

14.06 - Partial Utilization:

- A. Use by City at City's option of any substantially completed part of the work which: (i) has specifically been identified in the contract documents, or (ii) Engineer and Contractor agree constitutes a separately functioning and usable part of the work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the

remainder of the work, may be accomplished prior to Substantial completion of all the work subject to the following:

1. Engineer at any time may request Contractor in writing to permit City to use any such part of the work which Owner believes to be ready for its intended use and substantially complete. If Contractor agrees that such will certify to Engineer that such part of the work is substantially complete and request City Engineer to issue a certificate of substantial completion for that part of the work.
2. Contractor at any time may notify Engineer in writing that Contractor considers any such part of the work ready for its intended use and substantially complete and request City Engineer to issue a certificate of substantial completion for that part of the work.
3. Within a reasonable time after either such request, Contractor and Engineer shall make an inspection of that part of the work to determine its status of completion. If Engineer does not consider that part of the work to be substantially complete, Engineer will notify Contractor in writing giving the reasons therefore. If Engineer considers that part of the work to be substantially complete, the provisions of paragraph 14.05 will apply with respect to certification of substantial completion of that part of the work and the division of responsibility in respect thereof and access thereto.
4. No occupancy or separate operation of part of the work will be accomplished prior to compliance with the requirements of property insurance.

14.07 - Final Inspection:

Upon written notice from Contractor that the entire work or an agreed portion thereof is completed, Engineer will make a final inspection with Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such work or remedy such deficiencies.

14.08 - Final Application for Payment:

- A. After Contractor has completed all such corrections to the satisfaction of Engineer and delivered in accordance with the contract documents all maintenance and operating instructions, schedules, guarantees, Bonds, certificates or other evidence of insurance required certificates of inspection, marked-up record documents and other documents. Contractor may make application for final payment following the procedure for progress payments.
- B. The final application for payment shall be accompanied (except at previously delivered) by: (i) all documentation called for in the contract documents, including but not limited to the evidence of insurance required by, (ii) consent of the surety, if any, to final payment, and (iii) complete and legally effective releases or waivers (satisfactory to Engineer) of all liens arising out of or filed in connection with the work.
- C. In lieu of such releases or waivers of liens and as approved by City, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include

all labor, services, material and equipment for which a lien could be filed, and (ii) all payrolls, material and equipment bills and other indebtedness connected with the work for which City or City's property might in any way be responsible have been paid for otherwise satisfied. If any Subcontractor or Supplier fails to furnish a Bond or other collateral satisfactory to City to indemnify City against any lien.

14.09 - Final Payment and Acceptance:

If on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final application for payment and accompanying documentation--all as required by the contract documents, Engineer is satisfied that the work has been completed and Contractor's other obligations under the contract documents have been fulfilled. Engineer will, within thirty days after receipt of the final application for payment, indicate in writing Engineer's recommendation of payment and present the Application to City for payment. At the same time City Engineer will give written notice to Contractor that the work is acceptable subject to the provisions of paragraph 14.10. Otherwise, Engineer will return the application to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the application.

Thirty days after the corrected presentation to Engineer of the application and accompanying documentation, in appropriate form and substance and with Engineer's recommendation and notice of acceptability, the amount recommended by Engineer will become due and will be paid by City to Contractor.

If through no fault of Contractor, final completion of the work is significantly delayed and if Engineer so confirms, Owner shall, upon receipt of Contractor's final application for payment and recommendation of Engineer, and without terminating the Agreement, make payment of the balance due for that portion of the work fully completed and accepted. If the remaining balance to be held by City for work not fully completed or corrected is less than the retainage stipulated in the agreement, and if bonds have been furnished as required the written consent of the surety to the payment of the balance due for that portion of the work fully completed and accepted shall be submitted by Contractor to Engineer with the application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall constitute a waiver of claims.

14.10 - Waiver of Claims:

The making and acceptance of final payment will constitute:

- A. a waiver of all claims by City against Contractor, except claims arising from unsettled liens, from defective work appearing after final inspection pursuant to paragraph 14.07, from failure to comply with the contract documents or the terms of any special guarantees specified therein or from Contractor's continuing obligations under the contract documents; and
- B. A waiver of all claims by Contractor against Owner other than those previously made in writing and still unsettled.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.01 - Owner May Suspend Work:

With cause, the Owner may suspend the Work or any portion thereof by notice in writing to Contractor and Owner which will fix the date on which work will be resumed. Contractor shall resume the work on the date so fixed.

Contractor may be allowed an adjustment in the contract price or an extension of the contract times, or both, directly attributable to any such suspension if Contractor makes an approved claim.

15.02 - Owner May Terminate:

Upon the occurrence of any one or more of the following events:

- A. If Contractor persistently fails to perform the work in accordance with the contract documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule established.
- B. If Contractor disregards laws or regulations of any public body having jurisdiction;
- C. If Contractor disregards the authority of Engineer; or
- D. If Contractor otherwise violates in any substantial way any provisions of the contract documents;

City may, after giving Contractor (and the surety,) seven days written notice and to the extent permitted by Laws and Regulations, terminate the services of Contractor, exclude Contractor from the site and take possession of the work and of all Contractor's tools, appliances, construction equipment and machinery at the site and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion), incorporate in the work all materials and equipment stored at the site or for which Owner has paid Contractor but which are stored elsewhere, and finish the work as Owner may deem expedient. In such case Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the contract price exceeds all costs, losses and damages sustained by City arising out of or resulting from completing the work (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) such excess will be paid to Contractor. If such costs, losses or damages exceed such unpaid balance, Contractor shall pay the difference to City. Such costs, losses or damages incurred by City will be reviewed by Engineer as to their reasonableness and when so approved by Engineer incorporated in a change order, provided that when exercising any rights or remedies under this paragraph City shall not be required to obtain the lowest price for the work performed.

Where Contractor's services have been so terminated by City, the termination will not affect any rights or remedies of City against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by City will not release Contractor from liability.

Upon seven days written notice to Contractor and City may, elect to terminate the agreement. In such case, contractor shall be paid (without duplication of any items):

- A. For completed and acceptable work executed in accordance with the contract documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such work;
- B. For expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials or equipment as required by the contract documents in connection with uncompleted work, plus fair and reasonable sums for overhead and profit on such expenses;
- C. For amounts paid in settlement of terminated contracts with subcontractors, suppliers and others (including but not limited to fees and charges of engineers, architects, attorneys, and other professionals and court and arbitration or other dispute resolution costs incurred in connection with termination of contractors with subcontractors and suppliers); and
- D. For reasonable expenses directly attributable to termination.

Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss or any consequential damages arising out of such termination.

15.03 - Contractor May Stop Work or Terminate:

If through no act or fault of Contractor, the work is suspended for a period of more than ninety days by City or under an order of court or other public authority, or Engineer fails to act on any application for payment within forty-five days after it is submitted or City fails for thirty days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to City Engineer, and provided City Engineer does not remedy such suspension or failure within that time, terminate the agreement and recover from City payment on the same terms as provided in paragraph 15.04. In lieu of terminating the agreement and without prejudice to any other right or remedy, if Engineer has failed to act on an application for payment within thirty days after it is submitted, or City has failed for thirty days to pay Contractor any sum finally determined to be due, Contractor may upon seven days written notice to City Engineer stop the work until payment of all such amounts due Contractor, including interest thereon. The provisions of this paragraph 15.05 are not intended to preclude Contractor from making claim for an adjustment in contract price or contract times or otherwise for expenses or damage directly attributable to Contractor's stopping work as permitted by this paragraph.

END OF SECTION 00700

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
PROJECT NO. P26-0010

SECTION 00800 - SUPPLEMENTARY GENERAL CONDITIONS

1. PART 1 - GENERAL

1.1. DESCRIPTION:

A. This section is intended as a supplement to the General Conditions of the contract in the following areas:

- (1) Bonding requirements for the project
- (2) Insurance Coverage
 - (a) General Requirements for Insurance
 - (b) Commercial General Liability
 - (c) Motor Vehicle Liability
 - (d) Owner's & Contractors Protective Liability
 - (e) Additional Insured for the Project
 - (f) Property Damage Coverage
 - (g) Contractor's Pollution Liability
- (3) Proof of Insurance coverage
- (4) Payments for work as completed
- (5) Liquidated Damages
- (6) Safety and Protection
- (7) Special Project Conditions

2. PART 2 - APPLICATION

2.1. GENERAL CONDITIONS, SECTION 3, INSURANCE:

A. GENERAL REQUIREMENTS

- (1) All coverages shall be with insurance carriers licensed and admitted to do business in the State of Michigan and acceptable to the City of Port Huron.
- (2) If any of the required coverages expire during the term of this Contract, the Contractor shall deliver renewal certificates and/or policies to the City of Port Huron at least ten (10) days prior to the expiration date.
- (3) Liability limits over \$1,000,000 per occurrence may be obtained by providing Excess Liability (Umbrella) coverage in addition to the General Liability Coverage.

B. SUBSECTION 3.05; COMMERCIAL GENERAL LIABILITY COVERAGE

- (1) The Contractor shall procure and maintain during the life of this

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Contract, Commercial General Liability Insurance on an "Occurrence Basis" with limits of liability not less than **\$1,000,000** per occurrence and/or aggregate combined single limit, Personal Injury, Bodily Injury and Property Damage. Coverage shall include the following extensions: (A) Contractual Liability; (B) Products and Completed Operations; (C) Independent Contractors Coverage; (D) Broad Form General Liability Extensions or equivalent; (E) Deletion of all Explosion, Collapse and Underground (XCU) Exclusions, if applicable.

- (2) Broad form property damage shall be included in the General Liability coverage.
- (3) Coverage shall include all damages which may be incurred as a result of the Contractor's operations including but not limited to sewer surcharging or backup.

C. SUBSECTION 3.06; MOTOR VEHICLE LIABILITY

- (1) The Contractor shall procure and maintain during the life of this Contract, Motor Vehicle Liability Insurance, including applicable No-Fault coverages with limits of liability of not less than **\$1,000,000** per occurrence combined single limit Bodily Injury and Property Damage. Coverage shall include all owned vehicles, all non-owned vehicles and all hired vehicles.

D. SUBSECTION 3.07; OWNER'S & CONTRACTORS PROTECTIVE LIABILITY

- (1) The Contractor shall procure and maintain during the life of this contract, a separate Owner's & Contractor's Protective Liability Policy with limits of liability not less than **\$1,000,000** per occurrence and/or aggregate, combined single limit, Personal Injury, Bodily Injury and Property Damage. The City of Port Huron shall be "Named insured" on said coverage. Sixty (60) days Notice of Cancellation shall apply to this policy.
- (2) As an alternative, a per project aggregate on the Commercial General Liability insurance policy may be an acceptable substitute to the OCP policy.

E. SUBSECTION 3.08; ADDITIONAL INSURED:

- (1) It is understood and agreed that the following shall be Additional Insured on the General Liability and Vehicle Liability Insurance Coverage:
 - (a) The City of Port Huron, Michigan
 - (b) All elected and appointed officials and volunteers,
 - (c) The employees of the City of Port Huron, Michigan,
 - (d) All Boards, commissions and/or authorities and their board

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- members, employees and volunteers.
- (e) Anderson Eckstein and Westrick, Inc. (AEW) as a Contractor for the City of Port Huron and as Project Design Firm for this project.
- (2) This coverage shall be primary to the Additional Insureds, and not contributing with any other insurance or similar protection available to the Additional Insureds whether other available coverage be primary, contributing or excess.

F. SUBSECTION 3.09; PROPERTY INSURANCE:

- (1) Broad form property damage shall be included in the General Liability coverage.
- (2) Coverage shall include all damages which may be incurred as a result of the Contractor's operations including but not limited to sewer surcharging or backup.

G. CONTRACTOR'S POLLUTION LIABILITY COVERAGE:

- (1) The Contractor shall procure and maintain coverage, for the duration of this contract, for pollution legal liability (Contractor's Pollution Liability) including investigation and legal defense, for bodily injury and property damage, including loss of use of damaged property or of property that has not been physically damaged or destroyed. Such insurance shall provide coverage for both on site and off site clean-up costs and cover gradual and sudden pollution. Coverage shall be for minimum limits of **\$1,000,000** per occurrence or claim and not less than **\$1,000,000** annual aggregate. Coverage shall contain a per Contract aggregate endorsement. Sixty (60) days Notice of Cancellation shall apply to this policy.

2.2. GENERAL CONDITIONS, SECTION 3; PROOF OF INSURANCE COVERAGE:

- A. The Certificate Holder for proof of coverage shall be the City of Port Huron, Engineering Division.
- B. Workers Compensation Insurance, Commercial General Liability Insurance and Motor Vehicle Liability Insurance as described in the General Conditions and Supplementary General Conditions of the Contract shall include an endorsement stating the following: Sixty (60) days Advance Written Notice of Cancellation, Non-Renewal, Reduction and/or Material Change shall be sent to:
Brent Moore, P.E.
City of Port Huron, Engineering Division
100 McMorran Boulevard

FIRE STATION NO. 4 BUILDING IMPROVEMENTS

PROJECT NO. P26-0010

Port Huron, Michigan 48060

2.3. GENERAL CONDITIONS, SECTION 14; PAYMENTS FOR WORK COMPLETED:

- A. It is the intent of the City that all work on the project shall be completed in a timely manner and be paid for in a single payment following final completion and acceptance of the work.

2.4. LIQUIDATED DAMAGES:

- A. CONTRACTOR and OWNER recognize that time is of the essence of this Agreement and that OWNER will suffer financial loss if the Work is not completed within the time(s) specified in Article 4 of the Agreement, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by OWNER if the Work is not completed on time. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty), CONTRACTOR shall pay OWNER seven hundred fifty dollars (\$750) for each day that expires after the time specified in the Article 4 Agreement until the Work is substantially complete. After Substantial Completion, if CONTRACTOR shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by OWNER, CONTRACTOR shall pay OWNER seven hundred fifty dollars (\$750) for each day that expires after the time specified in the Agreement for completion and readiness for final payment until the Work is completed and ready for final payment.

2.5. GENERAL CONDITIONS, SECTION 6.17; SAFETY AND PROTECTION:

- A. The Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work.
- B. **Any time the normal function of any roadway in the project area is suspended, by work operations, equipment or other means, the Contractor shall provide Traffic Control in conformance with the Michigan Manual of Uniform Traffic Control Devices.** The Contractor shall be liable for all accidents and damages occasioned in any way by his acts or neglect, or by the acts or neglect of his Subcontractors, agents, employees, or workmen.”

END OF SECTION 00800

CITY OF PORT HURON

SPECIAL PROJECT CONDITIONS

1) Additional Proposal Pay Items

Pay items, which are not covered by a Special Provision in the contract documents shall be constructed and paid for in accordance with the requirements specified in the Michigan Department of Transportation 2020 Standard Specifications for Construction.

2) Sewer Televising

The Contractor shall perform videotaping of new sanitary and storm sewers including the catch basin leads for the project. The Contractor may be required to perform additional work to the new sewers based on the review of the sewer tape by the City of Port Huron and/or the Engineer.

3) Color Audio Video Inspection of the Project

Color Audio Video Inspection of the entire project area shall be required prior to construction start and after completion of the work for the project in accordance with the detailed project special provision Audiovisual Record. The video recording will only be accepted in digital format.

4) Compaction Requirements

The Contractor is advised that the plans and details for the project reflect a **98%** compaction requirement for utility trenches and the aggregate base course for the pavement section and within the 1 on 1 influence of the pavement.

5) Utility Testing

Testing costs and fees required for proposed sewer and water construction shall be considered incidental to the cost of the utility construction.

6) Bituminous Bond Coat

Placement of bituminous bond coats for asphalt pavement construction shall be included into the project paving costs.

7) Bracing, Sheeting and/or Shoring

Bracing, sheeting and/or temporary shoring, if required to be left in place, utility trench box or the temporary supporting of utility poles or lines shall be considered incidental to the cost of the water or sewer utility construction.

Contractor shall cap existing and proposed water main stubs and provide 10ft of “z” steel

FIRE STATION NO. 4 BUILDING IMPROVEMENTS

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sheet piling 4ft into virgin soil, directly against the cap or including a wedge between the cap and the steel for the phasing of the work and any stub that will be left for future water main connections.

8) Live Sewer Construction

The Contractor shall take appropriate precautions and measures to ensure that sewers will remain live during the construction project. The Contractor will be expected to build live sanitary sewers and connect individual services as the construction proceeds. Further, the Contractor shall be required to make temporary daily connections to the existing sewer to permit continued use of the existing sewer while the new sewers are being constructed. The cost of additional work on behalf of the Contractor for the daily connections to the existing sewer shall be considered incidental to the cost of the new utility construction. This may include the need for bypass pumping as downstream portions of sewer are abandoned or removed. The bypass pumping shall be considered incidental and will not be paid for separately.

9) Utility Crossing Clearance

Where proposed utility crossings will create an outside of pipe clearance of 18 inches or less, the Contractor shall backfill the trench area between the utilities with MDOT 21AA limestone, or 6A (minimum 95 percent crushed). Where proposed utility crossings will create an outside of pipe clearance of 6 inches or less, the Contractor shall place a concrete encasement around utility as shown on the drawings or as directed by Engineer.

10) Manhole Covers

Manhole covers shall be EJIW 1040 with ZPT type cover for sanitary and B Type for storm sewers or approved equal.

11) Tree Issues

It will be required to submit schedule of trimming to the Engineer for review and approval. No exception will be granted to these requirements. Any tree damaged by the Contractor not intended for removal, will be replaced with two trees at no additional cost to the City. The replacement trees must be acceptable to the City's Forester.

12) Sanitary Sewer Pipe 27 inches and Larger

Proposed sanitary sewer pipe 27 inch diameter and larger shall be reinforced concrete (C76), Class V, wall thickness "C" with extra thickness for corrosion allowance.

13) Salvaging Existing Drainage Frame, Cover, Valve Box and Hydrant Assembly

All the existing drainage frames, covers, valve boxes, and hydrant assemblies shall be removed protected from damage and delivered to the City of Port Huron Bancroft Office and will become the property of the City.

14) Storage / Staging Area

Where the contractor establishes material or equipment storage and or staging area, such area shall be fenced in such a manner to provide a barrier completely surrounding the area. The barrier shall not be less than six (6) feet in height and shall include an opaque covering such as polymer slats woven into a chain link fabric or tarp attached to the fence. The fence and associated screen shall provide visual screening to the adjoining properties or street. The installation and maintenance of the fence and screen shall be incidental to the project work and subject to approval of the Engineer. The City of Port Huron Permit Division must approve the proposed storage/ staging area.

15) Epoxy Anchored Lane Ties

Epoxy anchored lane ties are to be installed at locations where new concrete base or pavement matches into existing concrete pavement. Epoxy anchored lane ties shall include drilling holes for reinforcing bars, cleaning the drilled hole, installation of epoxy anchoring material, reinforcing bars and all labor, equipment to install a fully functional lane tie. Epoxy material shall be Hilti Y150 or approved equal.

Lane tie bars shall be placed at 24 inches on center for longitudinal joints and 12 inches on center for transverse joints. Lane ties shall be vertically located at the center of the existing concrete slab, but in no case shall they be less than 2-1/2 inches from the pavement surface. Lane ties shall be imbedded into the existing concrete pavement a minimum of 10”.

16) Copper Water Service Pipe

This work shall include the installation of Type “K” copper water service pipe of the designated diameter from an existing water main or a proposed water main to a curb stop, proposed or existing, and shall be measured horizontally from the centerline of the water main to the curb stop and shall be paid for at the contract unit price per linear foot.

17) Temporary Signage

Where temporary advance warning signage, such as Road Closed Ahead, or other sign(s) as directed by the Engineer, are installed in an off road area as part of the work and such sign(s) are to remain in place for a period of more than seven (7) calendar days, the post(s) for such sign(s) shall be driven into the underlying soil. Payment for this work shall be considered incidental to the project.

“Businesses Open During Construction” signage shall be installed as directed by the Engineer. Payment for this signage shall be included in the pay item for Sign, Type B, Temp, Special

18) Work Sequence

CONTRACTOR shall arrange Work so that at no time shall it cause unnecessary interruption to the operation of existing facilities. In order to meet the overall objective of this Project, certain elements of the Work must be completed in a particular sequence.

It may also be necessary to complete certain parts of the Work outside normal working hours. CONTRACTOR shall perform this Work at such times and at no additional cost to Owner.

CONTRACTOR shall prepare and submit after hour permit to ENGINEER for approval, a complete detailed work schedule setting forth the sequence of operations CONTRACTOR proposes to follow.

19) Work Restriction

Contractor is required to provide sequencing for all proposed construction activity within the area for review and approval by the City.

Contractor shall be required to restore each block of a street with an aggregate driving surface within one week following completion of the utility work. NO City block shall be left unpaved for a period of more than eight (8) weeks. The City may grant minor exception to these sequencing requirements to accommodate utility work.

20) Project Coordination

CONTRACTOR shall coordinate work with other Contractors activities within the City Limits including agencies engaged to perform inspections, tests, staking, MDOT coordination and similar services and activities to accommodate required services with a minimum of delay. In addition CONTRACTOR is responsible to coordinate any Street closing or traffic detour with all emergencies services, City Departments, Public Transportation, MDOT and other entities that may be impacted by the Contractor construction activities. Contractor shall be responsible for coordination of all of his construction activities with others as specified above to minimize delay and avoid problem due to construction activities.

CONTRACTOR is responsible for scheduling times for inspections, tests, taking samples and other similar activities

21) Control of Construction Nuisance (Odor, Dust, and Noise)

CONTRACTOR shall observe all pertinent ordinances and regulations.

CONTRACTOR shall eliminate noise to as great an extent as possible at all times. Air compressors shall be equipped with silencers, and the exhaust of all gasoline motors and other power equipment shall be provided with mufflers. In the vicinity of hospitals, libraries and schools, special precautions shall be taken to avoid noise and other nuisance such as odors.

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
PROJECT NO. P26-0010

CONTRACTOR shall take all steps necessary for the elimination or prevention of dust nuisance cause by or resulting from CONTRACTOR's operations and shall apply dust palliative as provided in the contract and as directed by ENGINEER.

22) Non-Hazardous Contaminated Materials Handling and Disposal

Payment for Handling and Disposal of Non-Hazardous Contaminated Material will be paid for under the Special Provision "Non Haz Contaminated Materials Handling and Disposal" as provided in the Contract.

23) Lawn Restoration

Payment for Lawn Restoration will be paid under the Special Provision "Lawn Restoration" as provided in the contract.

24) Solid Waster Collection

Solid waste (refuse, recycling, & yard waste) collection within and adjacent to the work area is serviced publically and/or privately. Collection times are variable by day, time, and frequency and may be provided at curbside or to a solid waste receptacle located on private property. Contractor shall be responsible to coordinate solid waste collection from all properties impacted by the construction work. Access shall be provided to collection trucks to all properties within the construction site. If truck access is not provided or access is denied, Contractor shall be responsible to collect and deliver; refuse to the landfill, recycled materials to a licensed recycling center, and yard waste to a composting facility. Cost of providing this service shall be included with other items of work and will not be paid separately.

25) Lawn Sprinklers

- a) Contractor shall be responsible for fixing any sprinkler systems broken by the work. This work shall be incidental to the project.
- b) In the event a sprinkler system is damaged, the Contractor shall have onsite the appropriate materials to immediately plug the damaged lines so as to minimize water loss incurred by the water customer.
- c) Repair of underground sprinkler systems shall be performed by experienced workers specializing in the installation and repair of lawn irrigation systems. The repair shall be made in coordination with the owner and done to the satisfaction of the owner and/or Engineer.
- d) Glued joints should be allowed to set at least twenty-four (24) hours before the system is re-pressurized or for the length of time specified by the material manufacturer.
- e) Once the system is re-pressurized, the repair shall be checked for leaks and the system flushed out.

26) Contaminated Soils and Water Main Construction Procedure

In the event contaminated soils are encountered, the Contractor shall excavate, store, sample and dispose of the material as described in the special provision for "Non Haz Contaminated Material Handling and Disposal". Should the contaminated soil be in an area of proposed water main replacement the contractor shall provide wrapped water main as noted in the special provision for "Alterations to the Port Huron Municipal Water System". Ductile iron pipe and appurtenances constructed within contaminated areas will require a special polyethylene wrap as recommended by the manufacturer and in accordance with AWWA specification C105 (ANSI A21.5). Polyethylene wrap/encasement and specialty gaskets for contaminated areas will be paid for ad Polyethylene Encasement.

27) Force Account Work - Subcontracting or Hiring Service by Others

For administration costs in connection with approved subcontract work or hiring services by others to perform specialized type of work which the Contractor is not qualified to do, the Contractor shall receive an amount equal to five percent (5%) of the total cost of the work computed as set forth above. Prior approval by the Engineer is required.

28) Water main

Existing water main age varies from 50 to 105 years old. Existing water main materials vary. The Contractor shall have appropriate materials available to repair water main in the event of a water main break.

Exploratory excavation may be required in advanced to determine material type and size prior to connecting to existing water main.

29) Drainage Structure Casting Adjustment

All utility structures and monument boxes within the pavement area shall have their covers and castings removed and the structures plated prior to the placement of the leveling course(s). This plate is to be removed and the structures adjusted after the completion of all leveling courses, but prior to the placement of the final wearing course. Payment for this work shall be considered incidental to the drainage structures construction.

30) Water Service Shutdowns and Notification

Commercial and Industrial customers impacted by disruption in water service shall be notified by contractor in writing a minimum of 1 week in advance of planned disruption. Commercial and Industrial operations may necessitate shutdowns be timed outside of normal working hours (nights or weekends). No additional compensation will be made to contractor for work outside of normal working hours.

END OF SECTION 00810

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
PROJECT NO. P26-0010

SECTION 00820 - SPECIAL PROJECT CONDITIONS

1. PART 1 - GENERAL

1.1. DESCRIPTION

- A. Project Name: Fire Station No. 4 Building Improvements
Project No.: P26-0010

The work under this section includes renovation and repairs to the existing fire station apparatus bay and surrounding exterior areas. The work includes removal and replacement of the concrete driveway and select sidewalks, replacement of sealant around perimeter of building, tuckpointing decorative block, repairing cracks/spalling in concrete Apparatus Bay floor and applying new epoxy coating, replacement of existing roofing with new dimensional shingles, and rerouting and replacement of downspouts.

1.2. REFERENCES

City	City of Port Huron, Michigan
DPW	City of Port Huron Department of Public Works
PHFD	City of Port Huron Fire Department
WFP	City of Port Huron Water Filtration Plant
WWTP	City of Port Huron Waste Water Treatment Plant

1.3. SUBMITTALS

- A. Submittals from the Contractor, pertaining to proposed work schedules, haul routes and description of work operations, shall be provided in writing and received by the City of Port Huron, Engineering Division not less than five (5) days prior to the pre-construction conference for the project.

1.4. COMMUNICATIONS / CONTACTS

- A. City of Port Huron, Engineering Division
100 McMorran Boulevard
Port Huron, Michigan 48060
Project representative: Brent Moore, phone (810) 984-9730
- B. The City of Port Huron Utilities Superintendent, Shawn Eagle, may be reached by phone at (810) 984-9770.
- C. The PHFD contact for the project is Chief Corey Nichols, PHFD Central Station (810) 984-9752.
- D. The WFP contact for the project is Jamie Cameron, WFP Superintendent, (810) 984-9780.
- E. The WWTP contact for the project is Dianna Seifert, WWTP Supervisor, (810) 984-9775.

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2. PART 2 - PRODUCTS AND MATERIALS

(Not applicable)

3. PART 3 - EXECUTION

3.1. PRECONSTRUCTION CONFERENCE

- A. Upon review and approval of executed Contract documents, bonding and insurance as provided by the Contractor for the project the owner will schedule a Preconstruction Conference for the project.
- B. Contractor shall come prepared with list of suppliers, subcontractors, emergency contact numbers, sequence of work, and schedule.

3.2. PREPARATION

- A. The contractor shall notify the City of Port Engineering Division representative, facility contact(s), and PHFD not less than 48 hours prior to arriving on site and beginning any work on the project.

3.3. INSPECTION AND TESTING

- A. All work and equipment on the project is subject to Inspection and Testing by the City of Port Huron and designated representatives.
- B. The Owner will select the testing laboratory for tests requested by the Owner.
- C.
 - (1) Payment for testing services
 - (2) The Owner will pay for all initial testing services requested by the Owner.
 - (3) When initial tests indicate noncompliance with the Contract Documents, all subsequent retesting occasioned by the noncompliance shall be performed by the same testing laboratory, and the costs thereof will be deducted by the Owner from progress payments to the Contractor.
 - (4) The Contractor will pay for all testing services requested by the Contractor.
 - (5) All Inspections and tests required by codes or ordinances or by a plan approval authority, and made by a legally constituted authority, shall be the responsibility of and shall be paid for by the Contractor as incidental to the project, unless otherwise provided in the Contract Documents.
- D. Delay for Inspection and Testing.
 - (1) No consideration to claims for compensation will be given for reasonable delay as a result of or to accommodate Inspection and or Testing.

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3.4. SCHEDULES

- A. The project work schedule and work operations shall be coordinated with and subject to approval by the Owner.

3.5. HAUL ROUTES

- A. Proposed Haul Routes and scheduling of Hauls for both materials and equipment are subject to the approval of the Owner and any other applicable regulatory agencies.

3.6. MEASUREMENT AND PAYMENT

- A. Testing completed under this section for which payment is the responsibility of the City shall be invoiced directly to the City by the testing firm.
- B. Invoiced amounts for Testing Services will be paid directly to the testing firm.
- C. Work completed under this section which is called out above as being the responsibility of the Contractor shall be considered as incidental to the overall project.

END OF SECTION 00820

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
PROJECT NO. P26-0010

SECTION 00851 - INDEX OF DRAWING

TITLE SHEET

The following drawings dated March 27, 2026, are issued for Fire Station No. 4 Building Renovation, Port Huron, Michigan. Project No P26-0010

TITLE SHEET

<u>SHEET NO.</u>	<u>TITLE</u>
	COVER SHEET
C1.0	REMOVAL PLAN
C2.0	CONSTRUCTION PLAN AND DETAILS
Y-602A	CITY OF PORT HURON CONCRETE PAVEMENT STANDARD DETAILS
Y-602B	CITY OF PORT HURON CONCRETE DRIVE, ISLAND AND SIDEWALK STANDARD DETAILS
A021	GENERAL PROJECT INFORMATION
AD121	DEMOLITION ROOF PLAN
A101	FIRST FLOOR PLAN
A121	ROOF PLAN
A201	EXTERIOR ELEVATIONS
A202	EXTERIOR ELEVATIONS
A601	DETAILS

END OF SECTION 00851

SECTION 01 10 00 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Contract description.
2. Work by Owner or other Work at the Site.
3. Owner-furnished products.
4. Contractor's use of Site and premises.
5. Work sequence.
6. Owner occupancy.
7. Permits.
8. Specification conventions.

1.2 CONTRACT DESCRIPTION

- A. Work of the Project includes is as identified in the bidding documents.
- B. Perform Work of Contract under fixed cost Contract with Owner according to Conditions of Contract.

1.3 WORK BY OWNER OR OTHERS

- A. Owner will award contracts, if required, for installation of security system and cameras, audio/visual and other low voltage system under a separate contract, unless called out in the Contract Document.
- B. If Owner-awarded contracts interfere with each other due to work being performed at the same time or at the same Site, Owner will determine the sequence of work under all contracts according to "Work Sequence" and "Contractor's Use of Site" Articles in this Section.
- C. Coordinate Work with utilities of Owner and public or private agencies.
- D. Work under this Contract includes:
1. Work as indicated in the Contract Documents.

1.4 CONTRACTOR'S USE OF SITE AND PREMISES

- A. Limit use of Site and premises to allow:

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1. Owner occupancy.
 2. Work by Others.
 3. Use of Site and premises by the public.
- B. Construction Operations: Limited to areas indicated on Drawings.
1. Noisy and Disruptive Operations (such as Use of Jack Hammers and Other Noisy Equipment): Coordinate and schedule such operations with Owner to minimize disruptions.
- C. Utility Outages and Shutdown:
1. Coordinate and schedule electrical and other utility outages with Owner.
- D. Construction Plan: Before start of construction, post electronic file to Project website of construction plan regarding access to Work, use of Site, and utility outages for acceptance by Owner. After acceptance of plan, construction operations shall comply with accepted plan unless deviations are accepted by Owner in writing.
- E. Background Checks: All Contractor employees, subcontractors, and sub-subcontractors are subject to background check and approval of the XXX Safety Department prior to working on-site.

1.5 WORK SEQUENCE

- A. Construct Work in order to accommodate Owner's occupancy requirements during construction period. Coordinate construction schedule and operations with Owner:
- B. Sequencing of Construction Plan: Before start of construction, post electronic file to Project website of construction plan regarding phasing of demolition, renovation, and new Work for acceptance by Owner. After acceptance of plan, construction sequencing shall comply with accepted plan unless deviations are accepted by Owner in writing.

1.6 OWNER OCCUPANCY

- A. Owner will occupy Premises during entire period of construction.
- B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- C. Schedule the Work to accommodate Owner occupancy.

1.7 SPECIFICATION CONVENTIONS

- A. These Specifications are written in imperative mood and streamlined form. This imperative language is directed to Contractor unless specifically noted otherwise. The

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words "shall be" are included by inference where a colon (:) is used within sentences or phrases.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 01 10 00

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SECTION 01 20 00 - PRICE AND PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Schedule of Values.
- B. Application for Payment.
- C. Change procedures.
- D. Defect assessment.

1.2 SCHEDULE OF VALUES

- A. Submit electronic file to Project website of schedule on AIA G703 - Continuation Sheet for G702.
- B. Submit Schedule of Values as electronic file to Project website within 15 days after date of Owner-Contractor Agreement.
- C. Format: Use Table of Contents of this Project Manual. Identify each line item with number and title of major Specification Section. Also identify Site mobilization, bonds and insurance, General Conditions, and General Contractor Overhead and Profit.
- D. Include separately from each line item, direct proportional amount of Contractor's overhead and profit.
- E. Revise schedule to list approved Change Orders with each Application for Payment.

1.3 APPLICATION FOR PAYMENT

- A. Submit electronic file to Project website of each Application for Payment on AIA G702 - Application and Certificate for Payment and AIA G703 - Continuation Sheet for G702.
- B. Content and Format: Use Schedule of Values for listing items in Application for Payment.
- C. Submit updated construction schedule with each Application for Payment.
- D. Payment Period: Submit at intervals stipulated in the Agreement.
- E. Submit submittals with transmittal letter as specified in Section 01 33 00 - Submittal Procedures.
- F. Submit three copies of waivers requested by Owner.
- G. Substantiating Data: When Architect/Engineer requires substantiating information, submit data justifying dollar amounts in question. Include the following with Application for Payment:
 - 1. Current construction photographs specified in Section 01 33 00 - Submittal Procedures or requested by the Architect.
 - 2. Partial release of liens from major Subcontractors and vendors.

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3. Record Documents as specified in Section 01 70 00 - Execution and Closeout Requirements, for review by Owner, which will be returned to Contractor.
4. Affidavits attesting to off-Site stored products.
5. Construction Progress Schedule, revised and current as specified in Section 01 33 00 - Submittal Procedures.

1.4 CHANGE PROCEDURES

- A. Submittals: Submit name of individual who is authorized to receive change documents and is responsible for informing others in Contractor's employ or Subcontractors of changes to the Work.
- B. Carefully study and compare Contract Documents before proceeding with fabrication and installation of Work. Promptly advise Architect/Engineer of any error, inconsistency, omission, or apparent discrepancy.
- C. Requests for Interpretation (RFI) and Clarifications: Allot time in construction scheduling for liaison with Architect/Engineer; establish procedures for handling queries and clarifications.
 1. Use AIA G716 - Request for Information for requesting interpretations.
 2. Architect/Engineer may respond with a direct answer on the Request for Interpretation form, AIA G710 - Architect's Supplemental Instruction, or AIA G709 - Work Changes Proposal Request.
- D. Architect/Engineer will advise of minor changes in the Work not involving adjustment to Contract Sum/Price or Contract Time by issuing supplemental instructions on AIA G710.
- E. Architect/Engineer may issue AIA G709 including a detailed description of proposed change with supplementary or revised Drawings and Specifications, a change in Contract Time for executing the change with stipulation of overtime work required and with the period of time during which the requested price will be considered valid. Contractor will prepare and submit estimate within 10 days.
- F. Contractor may propose changes by submitting a request for change to Architect/Engineer, describing proposed change and its full effect on the Work. Include a statement describing reason for the change and the effect on Contract Sum/Price and Contract Time with full documentation and a statement describing effect on the Work by separate or other Contractors.
- G. Document requested substitutions according to Section 012500 - Substitution Procedures.
- H. Stipulated Sum/Price Change Order: Based on AIA G709 and Contractor's fixed price quotation or Contractor's request for Change Order as approved by Architect/Engineer.
- I. Unit Price Change Order: For Contract unit prices and quantities, the Change Order will be executed on a fixed unit price basis. For unit costs or quantities of units of that which are not predetermined, execute Work under Construction Change Directive. Changes in Contract Sum/Price or Contract Time will be computed as specified for Time and Material Change Order.
- J. Construction Change Directive: Architect/Engineer may issue directive, on AIA G714 - Construction Change Directive signed by Owner, instructing Contractor to proceed with change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work and designate method of determining any change in Contract Sum/Price or Contract Time. Promptly execute change.

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- K. Time and Material Change Order: Submit itemized account and supporting data after completion of change, within time limits indicated in Conditions of the Contract. Architect/Engineer will determine change allowable in Contract Sum/Price and Contract Time as provided in Contract Documents.
- L. Maintain detailed records of Work done on time and material basis. Provide full information required for evaluation of proposed changes and to substantiate costs for changes in the Work.
- M. Document each quotation for change in Project Cost or Time with sufficient data to allow evaluation of quotation.
- N. Change Order Forms: AIA G701 - Change Order.
- O. Execution of Change Orders: Architect/Engineer will issue Change Orders for signatures of parties as provided in Conditions of the Contract.
- P. Correlation of Contractor Submittals:
 - 1. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as separate line item and adjust Contract Sum/Price.
 - 2. Promptly revise Progress Schedules to reflect change in Contract Time, revise sub schedules to adjust times for other items of Work affected by the change, and resubmit.
 - 3. Promptly enter changes in Record Documents.

1.5 DEFECT ASSESSMENT

- A. Replace the Work, or portions of the Work, not conforming to specified requirements.
- B. If, in the opinion of Architect/Engineer, it is not practical to remove and replace the Work, Architect/Engineer will direct appropriate remedy or adjust payment.
- C. Authority of Architect/Engineer to assess defects and identify payment adjustments is final.
- D. Nonpayment for Rejected Products: Payment will not be made for rejected products for any of the following reasons:
 - 1. Products wasted or disposed of in a manner that is not acceptable.
 - 2. Products determined as unacceptable before or after placement.
 - 3. Products not completely unloaded from transporting vehicle.
 - 4. Products placed beyond lines and levels of the required Work.
 - 5. Products remaining on hand after completion of the Work.
 - 6. Loading, hauling, and disposing of rejected products.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 01 20 00

SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Quality assurance.
- B. Product options.
- C. Product substitution procedures.

1.2 QUALITY ASSURANCE

- A. Contract is based on products and standards established in Contract Documents without consideration of proposed substitutions.
- B. Products specified define standard of quality, type, function, dimension, appearance, and performance required.
- C. Substitution Proposals: Permitted for specified products except where specified otherwise. Do not substitute products unless substitution has been accepted and approved in writing by Owner.

1.3 PRODUCT OPTIONS

- A. See Section 01 60 00 - Product Requirements.

1.4 PRODUCT SUBSTITUTION PROCEDURES

- A. Architect/Engineer may consider requests for substitutions during bidding. Contractor to provide Substitution Request form in 01 25 01 and relevant supporting data. Requests must be submitted prior to the final deadline for questions during bidding. Architect/Engineer's decision on acceptance/rejection of products is final.
- B. Architect/Engineer may consider requests for substitutions within 15 days after date of Owner-Contractor Agreement. Contractor to provide Substitution Request form in 01 25 02 and relevant supporting data. Architect/Engineer's decision on acceptance/rejection of products is final.
- C. Substitutions may be considered if within 90 days of contract award a product becomes unavailable, through no fault of the contractor. Contractor to provide documentation from the product manufacturer that product is no longer available. Failure to provide notification that a product is no longer available within 90 days of contract award shall result in the Architect selecting an alternative material at no additional cost.
- D. Document each request with complete data, substantiating compliance of proposed substitution with Contract Documents, including:
 - 1. Manufacturer's name and address, product, trade name, model, or catalog number, performance and test data, and reference standards.
 - 2. Itemized point-by-point comparison of proposed substitution with specified product, listing variations in quality, performance, and other pertinent characteristics.
 - 3. Reference to Article and Paragraph numbers in Specification Section.

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
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4. Cost data comparing proposed substitution with specified product and amount of net change to Contract Sum.
 5. Changes required in other Work.
 6. Availability of maintenance service and source of replacement parts as applicable.
 7. Certified test data to show compliance with performance characteristics specified.
 8. Samples when applicable or requested.
 9. Other information as necessary to assist Architect/Engineer's evaluation.
- E. A request constitutes a representation that Bidder or Contractor:
1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product, and provides the same features and options as the specified product.
 2. Will provide same warranty for substitution as for specified product.
 3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
 4. Waives claims for additional costs or time extension that may subsequently become apparent.
 5. Will coordinate installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.
 6. Will reimburse Owner and Architect/Engineer for review or redesign services associated with reapproval by authorities having jurisdiction.
- F. Substitutions will not be considered when they are indicated or implied on Shop Drawing or Product Data submittals without separate written request or when acceptance will require revision to Contract Documents.
- G. Substitution Submittal Procedure:
1. Submit requests for substitutions on form 01 25 01 Request for Substitution Form.
 2. Submit electronic files to Project website of Request for Substitution for consideration. Limit each request to one proposed substitution.
 3. Submit Shop Drawings, Product Data, and certified test results attesting to proposed product equivalence. Burden of proof is on proposer.
 4. Architect/Engineer will notify Contractor in writing of decision to accept or reject request.
- 1.5 INSTALLER SUBSTITUTION PROCEDURES
- A. Architect/Engineer will consider requests for substitutions only within 15 days after date of Owner-Contractor Agreement.
- B. Document each request with:
1. Installer's qualifications.
 2. Installer's experience in work similar to that specified.
 3. Other information as necessary to assist Architect/Engineer's evaluation.
- C. Substitution Submittal Procedure:
1. Submit electronic files to Project website of Request for Substitution for consideration. Limit each request to one proposed substitution.
 2. Architect/Engineer will notify Contractor in writing of decision to accept or reject request.

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PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 01 25 00

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**SUBSTITUTION
REQUEST**
(During the Bidding Phase)

Project: _____ Substitution Request Number: _____

From: _____
To: _____ Date: _____
A/E Project Number: _____
Re: _____ Contract For: _____

Specification Title: _____ Description: _____
Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____
Manufacturer: _____ Address: _____ Phone: _____
Trade Name: _____ Model No.: _____

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by: _____
Signed by: _____
Firm: _____
Address: _____
Telephone: _____

A/E's REVIEW AND ACTION

- ☐ Substitution approved - Make submittals in accordance with Specification Section 01 33 00.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01 33 00.
☐ Substitution rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: _____ Date: _____

Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ _____

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**SUBSTITUTION
REQUEST**
(After the Bidding/Negotiating Phase)

Project: _____ Substitution Request Number: _____

_____ From: _____

To: _____ Date: _____

_____ A/E Project Number: _____

Re: _____ Contract For: _____

Specification Title: _____ Description: _____

Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ Phone: _____

Address: _____

Trade Name: _____ Model No.: _____

Installer: _____ Phone: _____

Address: _____

History: ☐ New Product ☐ 1-4 years old ☐ 5-10 years old ☐ More than 10 years old

Differences between proposed substitution and specified product: _____

☐ Point-by-point comparative data attached.

Reason for not providing specified item: _____

Similar Installation:

Project: _____ Architect: _____

Address: _____ Owner: _____

_____ Date Installed: _____

Proposed Substitution affects other parts of work: ☐ No ☐ Yes; explain _____

Savings to Owner for accepting substitution: _____ (\$_____).

Proposed substitution changes Contract Time: ☐ No ☐ Yes [Add] [Deduct] _____ days.

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
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Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests

☐ Reports ☐ _____ The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effects on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

Telephone: _____

Attachments: _____

A/E's Review Action

- ☐ Substitution approved – Make submittals in accordance with Specification Section 01 33 00.
- ☐ Substitution approved as noted – Make submittals in accordance with Specification Section 01 33 00.
- ☐ Substitution rejected – Use specified materials.
- ☐ Substitution Request received too late – Use specified materials.

Signed by: _____ Date: _____

Additional Comments: ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer

☐ A/E ☐ Other

SECTION 01 30 00 - ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Coordination and Project conditions.
- B. Preconstruction meeting.
- C. Site mobilization meeting.
- D. Progress meetings.
- E. Preinstallation meetings.
- F. Closeout meeting.
- G. Alteration procedures.

1.2 COORDINATION AND PROJECT CONDITIONS

- A. Coordinate scheduling, submittals, and Work of various Sections of Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later as identified by the owner.
- B. Verify that utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate Work of various Sections having interdependent responsibilities for installing, connecting to, and placing operating equipment in service.
- C. Coordinate space requirements, supports, and installation of mechanical and electrical Work indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit as closely as practical; place runs parallel with lines of building. Use spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
 - 1. Coordination Drawings: Prepare as required to coordinate all portions of Work. Show relationship and integration of different construction elements that require coordination during fabrication or installation to fit in space provided or to function as intended. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are important.
- D. Coordination Meetings: In addition to other meetings specified in this Section, hold coordination meetings with personnel and Subcontractors to ensure coordination of Work.
- E. In finished areas, conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements.
- F. Coordinate completion and clean-up of Work of separate Sections in preparation for Substantial Completion and for portions of Work designated for Owner's occupancy.
- G. After Owner's occupancy of premises, coordinate access to Site for correction of defective Work and Work not complying with Contract Documents, to minimize disruption of Owner's activities.

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1.3 PRECONSTRUCTION MEETING

- A. Architect/Engineer will schedule and preside over meeting after Notice of Award.
- B. Attendance Required: Architect/Engineer, Owner, and Contractor.
- C. Minimum Agenda:
 - 1. Execution of Owner-Contractor Agreement.
 - 2. Submission of executed bonds and insurance certificates.
 - 3. Distribution of Contract Documents.
 - 4. Submission of list of Subcontractors, list of products, schedule of values, and Progress Schedule.
 - 5. Designation of personnel representing parties in Contract, and Architect/Engineer.
 - 6. Communication procedures.
 - 7. Procedures and processing of requests for interpretations, field decisions, submittals, substitutions, Applications for Payments, proposal request, Change Orders, and Contract closeout procedures.
 - 8. Scheduling.
 - 9. Critical Work sequencing.
- D. Contractor: Record minutes and distribute electronic copies to participants within two days after meeting, with copies to Architect/Engineer, Owner, and those affected by decisions made.

1.4 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the Work at maximum bi-weekly intervals.
- B. Make arrangements for meetings, prepare agenda with copies for participants, and preside over meetings.
- C. Attendance Required: Job superintendent, major Subcontractors and suppliers, and Architect/Engineer, Owner, as appropriate to agenda topics for each meeting.
- D. Minimum Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Review of Work progress.
 - 3. Field observations, problems, and decisions.
 - 4. Identification of problems impeding planned progress.
 - 5. Review of submittal schedule and status of submittals.
 - 6. Review of off-Site fabrication and delivery schedules.
 - 7. Maintenance of Progress Schedule.
 - 8. Corrective measures to regain projected schedules.
 - 9. Planned progress during succeeding work period.
 - 10. Coordination of projected progress.
 - 11. Maintenance of quality and work standards.
 - 12. Effect of proposed changes on Progress Schedule and coordination.
 - 13. Other business relating to Work.
- E. Contractor: Record minutes and distribute electronic copies to participants within two days after meeting, with copies to Architect/Engineer, Owner, and those affected by decisions made.

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
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1.5 PREINSTALLATION MEETINGS

- A. When required in individual Specification Sections, convene preinstallation meetings at Project Site before starting Work of specific Section.
- B. Require attendance of parties directly affecting, or affected by, Work of specific Section.
- C. Notify Architect/Engineer four days in advance of meeting date.
- D. Prepare agenda and preside over meeting:
 - 1. Review conditions of installation, preparation, and installation procedures.
 - 2. Review coordination with related Work.
- E. Record minutes and distribute electronic copies to participants within two days after meeting, with copies to Architect/Engineer, Owner, and those affected by decisions made.

1.6 CLOSEOUT MEETING

- A. Schedule Project closeout meeting with sufficient time to prepare for requesting Substantial Completion. Preside over meeting and be responsible for minutes.
- B. Attendance Required: Contractor, Architect/Engineer, Owner, and others appropriate to agenda.
- C. Notify Architect/Engineer ten days in advance of meeting date.
- D. Minimum Agenda:
 - 1. Start-up of facilities and systems.
 - 2. Operations and maintenance manuals.
 - 3. Testing, adjusting, and balancing.
 - 4. System demonstration and observation.
 - 5. Operation and maintenance instructions for Owner's personnel.
 - 6. Contractor's inspection of Work.
 - 7. Contractor's preparation of an initial "punch list."
 - 8. Procedure to request Architect/Engineer inspection to determine date of Substantial Completion.
 - 9. Completion time for correcting deficiencies.
 - 10. Inspections by authorities having jurisdiction.
 - 11. Certificate of Occupancy and transfer of insurance responsibilities.
 - 12. Partial release of retainage.
 - 13. Final cleaning.
 - 14. Preparation for final inspection.
 - 15. Closeout Submittals:
 - a. Project record documents.
 - b. Operating and maintenance documents.
 - c. Operating and maintenance materials.
 - d. Affidavits.
 - 16. Final Application for Payment.
 - 17. Contractor's demobilization of Site.
 - 18. Maintenance.

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- E. Record minutes and distribute electronic copies to participants within five days after meeting, with copies to Architect/Engineer, Owner, and those affected by decisions made.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

3.1 ALTERATION PROCEDURES

- A. Designated areas of existing facilities will be occupied for normal operations during progress of construction. Cooperate with Owner in scheduling operations to minimize conflict and to permit continuous usage.
 - 1. Perform Work not to interfere with operations of occupied areas.
 - 2. Keep utility and service outages to a minimum and perform only after written approval of Owner.
 - 3. Clean Owner-occupied areas daily. Clean spillage, overspray, and heavy collection of dust in Owner-occupied areas immediately.
- B. Materials: As specified in product Sections; match existing products with new products for patching and extending Work.
- C. Employ skilled and experienced installer to perform alteration and renovation Work.
- D. Cut, move, or remove items as necessary for access to alterations and renovation Work. Replace and restore at completion. Comply with Section 01 70 00 - Execution and Closeout Requirements
- E. Remove unsuitable material not marked for salvage, including rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.
- F. Remove debris and abandoned items from area and from concealed spaces.
- G. Prepare surface and remove surface finishes to permit installation of new Work and finishes.
- H. Close openings in exterior surfaces to protect existing Work from weather and extremes of temperature and humidity.
- I. Remove, cut, and patch Work to minimize damage and to permit restoring products and finishes to match adjacent condition, unless specified otherwise.
- J. Refinish existing visible surfaces to remain in renovated rooms and spaces, to renewed condition for each material, with neat transition to adjacent finishes.
- K. Where new Work abuts or aligns with existing Work, provide smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.
- L. When finished surfaces are cut so that smooth transition with new Work is not possible, terminate existing surface along straight line at natural line of division and submit recommendation to Architect/Engineer for review.
- M. Where change of plane of 1/4 inch or more occurs, submit recommendation for providing smooth transition to Architect/Engineer for review.

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- N. Trim existing doors to clear new floor finish. Refinish trim to specified condition.
- O. Patch or replace portions of existing surfaces that are damaged, lifted, discolored, or showing other imperfections.
- P. Finish surfaces as specified in individual product Sections.

END OF SECTION 01 30 00

SECTION 01 32 16 - CONSTRUCTION PROGRESS SCHEDULE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Submittals.
- B. Quality assurance.
- C. Bar chart schedules.
- D. Review and evaluation.
- E. Updating schedules.
- F. Distribution.

1.2 SUBMITTALS

- A. Within 10 days after date of Owner-Contractor Agreement, submit proposed preliminary network diagram defining planned operations for Work.
- B. Participate in review of preliminary and complete network diagrams jointly with Architect/Engineer.
- C. Submit updated network schedules with each Application for Payment.
- D. Post as electronic file to Project website.
- E. Submit network schedules under transmittal letter form specified in Section 01 33 00 - Submittal Procedures.
- F. Schedule Updates:
 - 1. Overall percent complete, projected and actual.
 - 2. Completion progress by listed activity and sub-activity, to within five working days prior to submittal.
 - 3. Changes in Work scope and activities modified since submittal.
 - 4. Delays in submittals or resubmittals, deliveries, or Work.
 - 5. Adjusted or modified sequences of Work.
 - 6. Other identifiable changes.
 - 7. Revised projections of progress and completion.

1.3 QUALITY ASSURANCE

- A. Scheduler: Contractor's personnel specializing in CPM scheduling with five years' minimum experience in scheduling construction work of complexity comparable to the Project, and having use of computer facilities capable of delivering detailed graphic printout within 48 hours of request.
- B. Contractor's Administrative Personnel: five years' minimum experience in using and monitoring CPM schedules on comparable Projects.

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1.4 BAR CHART SCHEDULES

- A. Format: Bar chart Schedule, to include at least:
 - 1. Identification and listing in chronological order of those activities reasonably required to complete the Work, including:
 - a. Subcontract Work.
 - b. Major equipment design, fabrication, factory testing, and delivery dates including required lead times.
 - c. Move-in and other preliminary activities.
 - d. Equipment and equipment system test and startup activities.
 - e. Project closeout and cleanup.
 - f. Work sequences, constraints, and milestones.
 - 2. Listings identified by Specification Section number.
 - 3. Identification of the following:
 - a. Horizontal time frame by year, month, and week.
 - b. Duration, early start, and completion for each activity and sub-activity.
 - c. Critical activities and Project float.
 - d. Sub-schedules to further define critical portions of Work.

1.5 REVIEW AND EVALUATION

- A. Participate in joint review and evaluation of schedules with Architect/Engineer at each submittal.
- B. Evaluate Project status to determine Work behind schedule and Work ahead of schedule.
- C. After review, revise schedules incorporating results of review, and resubmit within **10** days.

1.6 UPDATING SCHEDULES

- A. Maintain schedules to record actual start and finish dates of completed activities.
- B. Indicate progress of each activity to date of revision, with projected completion date of each activity. Update schedules to depict current status of Work.
- C. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
- D. Upon approval of a Change Order, include the change in the next schedule submittal.
- E. Indicate changes required to maintain Date of Substantial Completion.
- F. Submit sorts as required to support recommended changes.
- G. Prepare narrative report to define problem areas, anticipated delays, and impact on schedule. Report corrective action taken or proposed and its effect including effects of changes on schedules of separate Contractors.

1.7 DISTRIBUTION

- A. Following joint review, distribute copies of updated schedules to Contractor's Project site file, to Subcontractors, suppliers, Architect/Engineer, Owner, and other concerned parties.

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- B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 01 32 16

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SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Definitions.
- B. Submittal procedures.
- C. Construction progress schedules.
- D. Proposed product list.
- E. Product data.
- F. Use of electronic CAD files of Project Drawings.
- G. Shop Drawings.
- H. Samples.
- I. Other submittals.
- J. Design data.
- K. Test reports.
- L. Certificates.
- M. Manufacturer's instructions.
- N. Manufacturer's field reports.
- O. Erection Drawings.
- P. Construction photographs.
- Q. Contractor review.
- R. Architect/Engineer review.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect/Engineer's responsive action.
- B. Informational Submittals: Written and graphic information and physical Samples that do not require Architect/Engineer's responsive action. Submittals may be rejected for not complying with requirements.

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1.3 SUBMITTAL PROCEDURES

- A. Number submittals with a prefix of the specification number related to the submittal, a sequential number, and a revision number (i.e. 092216-001-001).
- B. Identify: Project, Contractor, Subcontractor and supplier, pertinent Drawing and detail number, and Specification Section number appropriate to submittal.
- C. Apply Contractor's stamp, signed or initialed, certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is according to requirements of the Work and Contract Documents.
- D. Schedule submittals to expedite Project, and submit electronic submittals via email as PDF electronic files. Coordinate submission of related items.
- E. For each submittal for review, allow 15 working days excluding delivery time to and from Contractor.
- F. Identify variations in Contract Documents and product or system limitations that may be detrimental to successful performance of completed Work.
- G. Allow space on submittals for Contractor and Architect/Engineer review stamps.
- H. When revised for resubmission, identify changes made since previous submission.
- I. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.
- J. Submittals not requested will not be recognized nor processed.
- K. Incomplete Submittals: Architect/Engineer will not review. Complete submittals for each item are required. Delays resulting from incomplete submittals are not the responsibility of Architect/Engineer.

1.4 CONSTRUCTION PROGRESS SCHEDULES

- A. Comply with Section 01 32 16 - Construction Progress Schedule.

1.5 PROPOSED PRODUCT LIST

- A. Within 15 working days after date of Owner-Contractor Agreement, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, indicate manufacturer, trade name, model or catalog designation, and reference standards.

1.6 PRODUCT DATA

- A. Product Data: Action Submittal: Submit to Architect/Engineer for review for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Submit electronic submittals via email as PDF electronic files.

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- C. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- D. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- E. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 01 70 00 - Execution and Closeout Requirements.

1.7 ELECTRONIC CAD FILES OF PROJECT DRAWINGS

- A. Electronic CAD Files of Project Drawings: May only be used to expedite production of Shop Drawings for the Project. Use for other Projects or purposes is not allowed.
- B. Electronic CAD Files of Project Drawings: Distributed only under the following conditions:
 - 1. Use of files is solely at receiver's risk. Architect/Engineer does not warrant accuracy of files. Receiving files in electronic form does not relieve receiver of responsibilities for measurements, dimensions, and quantities set forth in Contract Documents. In the event of ambiguity, discrepancy, or conflict between information on electronic media and that in Contract Documents, notify Architect/Engineer of discrepancy and use information in hard-copy Drawings and Specifications.
 - 2. CAD files do not necessarily represent the latest Contract Documents, existing conditions, and as-built conditions. Receiver is responsible for determining and complying with these conditions and for incorporating addenda and modifications.
 - 3. User is responsible for removing information not normally provided on Shop Drawings and removing references to Contract Documents. Shop Drawings submitted with information associated with other trades or with references to Contract Documents will not be reviewed and will be immediately returned.
 - 4. Receiver shall not hold Architect/Engineer responsible for data or file clean-up required to make files usable, nor for error or malfunction in translation, interpretation, or use of this electronic information.
 - 5. Receiver shall understand that even though Architect/Engineer has computer virus scanning software to detect presence of computer viruses, there is no guarantee that computer viruses are not present in files or in electronic media.
 - 6. Receiver shall not hold Architect/Engineer responsible for such viruses or their consequences, and shall hold Architect/Engineer harmless against costs, losses, or damage caused by presence of computer virus in files or media.
 - 7. Receiver shall submit Electronic Documents Request Form, 01 33 01, indicating what documents are requested.

1.8 SHOP DRAWINGS

- A. Shop Drawings: Action Submittal: Submit to Architect/Engineer for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. When required by individual Specification Sections, provide Shop Drawings signed and sealed by a professional Engineer responsible for designing components shown on Shop Drawings.
 - 1. Include signed and sealed calculations to support design.

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2. Submit Shop Drawings and calculations in form suitable for submission to and approval by authorities having jurisdiction.
 3. Make revisions and provide additional information when required by authorities having jurisdiction.
- D. Submit electronic submittals via email as PDF electronic files.
- E. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 01 70 00 - Execution and Closeout Requirements.
- F. Shop drawings shall be drafted in a professional manner on a title block provided by the shop drawing producer. Markups, photocopies or PDF files of Construction Documents are not an acceptable shop drawing submittal.

1.9 SAMPLES

- A. Samples: Action Submittal: Submit to Architect/Engineer for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Samples for Selection as Specified in Product Sections:
1. Submit to Architect/Engineer for aesthetic, color, and finish selection.
 2. Submit Samples of finishes, textures, and patterns for Architect/Engineer selection.
- C. Submit Samples to illustrate functional and aesthetic characteristics of products, with integral parts and attachment devices. Coordinate Sample submittals for interfacing work.
- D. Include identification on each Sample, with full Project information.
- E. Submit number of Samples specified in individual Specification Sections; Architect/Engineer will retain one Sample.
- F. Reviewed Samples that may be used in the Work are indicated in individual Specification Sections.
- G. Samples will not be used for testing purposes unless specifically stated in Specification Section.
- H. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 01 70 00 - Execution and Closeout Requirements.

1.10 OTHER SUBMITTALS

- A. Closeout Submittals: Comply with Section 01 70 00 - Execution and Closeout Requirements.
- B. Informational Submittal: Submit data for Architect/Engineer's knowledge as Contract administrator or for Owner.
- C. Submit information for assessing conformance with information given and design concept expressed in Contract Documents.

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1.11 TEST REPORTS

- A. Informational Submittal: Submit reports for Architect/Engineer's knowledge as Contract administrator or for Owner.
- B. Submit test reports for information for assessing conformance with information given and design concept expressed in Contract Documents.

1.12 CERTIFICATES

- A. Informational Submittal: Submit certification by manufacturer, installation/application Subcontractor, or Contractor to Architect/Engineer, in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or product but must be acceptable to Architect/Engineer.

1.13 MANUFACTURER'S INSTRUCTIONS

- A. Informational Submittal: Submit manufacturer's installation instructions for Architect/Engineer's knowledge as Contract administrator or for Owner.
- B. Submit printed instructions for delivery, storage, assembly, installation, startup, adjusting, and finishing, to Architect/Engineer in quantities specified for Product Data.
- C. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.14 MANUFACTURER'S FIELD REPORTS

- A. Informational Submittal: Submit reports for Architect/Engineer's knowledge as Contract administrator or for Owner.
- B. Submit report within 5 days of observation to Architect/Engineer for information.
- C. Submit reports for information for assessing conformance with information given and design concept expressed in Contract Documents.

1.15 ERECTION DRAWINGS

- A. Informational Submittal: Submit Drawings for Architect/Engineer's knowledge as Contract administrator or for Owner.
- B. Submit Drawings for information assessing conformance with information given and design concept expressed in Contract Documents.
- C. Data indicating inappropriate or unacceptable Work may be subject to action by Architect/Engineer or Owner.

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1.16 CONTRACTOR REVIEW

- A. Review for compliance with Contract Documents and approve submittals before transmitting to Architect/Engineer.
- B. Contractor: Responsible for:
 - 1. Determination and verification of materials including manufacturer's catalog numbers.
 - 2. Determination and verification of field measurements and field construction criteria.
 - 3. Checking and coordinating information in submittal with requirements of Work and of Contract Documents.
 - 4. Determination of accuracy and completeness of dimensions and quantities.
 - 5. Confirmation and coordination of dimensions and field conditions at Site.
 - 6. Construction means, techniques, sequences, and procedures.
 - 7. Safety precautions.
 - 8. Coordination and performance of Work of all trades.
- C. Stamp, sign or initial, and date each submittal to certify compliance with requirements of Contract Documents.
- D. Do not fabricate products or begin Work for which submittals are required until approved submittals have been received from Architect/Engineer.

1.17 ARCHITECT/ENGINEER REVIEW

- A. Do not make "mass submittals" to Architect/Engineer. "Mass submittals" are defined as six or more submittals or items in one day or 15 or more submittals or items in one week. If "mass submittals" are received, Architect/Engineer's review time stated above will be extended as necessary to perform proper review. Architect/Engineer will review "mass submittals" based on priority determined by Architect/Engineer after consultation with Owner and Contractor.
- B. Informational submittals and other similar data are for Architect/Engineer's information, do not require Architect/Engineer's responsive action, and will not be reviewed or returned with comment.
- C. Submittals made by Contractor that are not required by Contract Documents may be returned without action.
- D. Submittal approval does not authorize changes to Contract requirements unless accompanied by Change Order, Architect's Supplemental Instruction or Construction Change Directive.
- E. Owner may withhold monies due to Contractor to cover additional costs beyond the second submittal review.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 01 33 00

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SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Quality control.
- B. Tolerances.
- C. References.
- D. Labeling.
- E. Mockup requirements.
- F. Testing and inspection services.
- G. Manufacturers' field services.

1.2 QUALITY CONTROL

- A. Monitor quality control over suppliers, manufacturers, products, services, Site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with specified standards as the minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- C. Perform Work using persons qualified to produce required and specified quality.
- D. Products, materials, and equipment may be subject to inspection by Architect/Engineer and Owner at place of manufacture or fabrication. Such inspections shall not relieve Contractor of complying with requirements of Contract Documents.
- E. Supervise performance of Work in such manner and by such means to ensure that Work, whether completed or in progress, will not be subjected to harmful, dangerous, damaging, or otherwise deleterious exposure during construction period.

1.3 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' recommended tolerances and tolerance requirements in reference standards. When such tolerances conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

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- C. Adjust products to appropriate dimensions; position before securing products in place.

1.4 REFERENCES

- A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current as of date for receiving Bids except where specific date is established by code.
- C. Obtain copies of standards and maintain on Site when required by product Specification Sections.
- D. When requirements of indicated reference standards conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- E. Neither contractual relationships, duties, or responsibilities of parties in Contract nor those of Architect/Engineer shall be altered from Contract Documents by mention or inference in reference documents.

1.5 LABELING

- A. Attach label from agency approved by authorities having jurisdiction for products, assemblies, and systems required to be labeled by applicable code.
- B. Label Information: Include manufacturer's or fabricator's identification, approved agency identification, and the following information, as applicable, on each label:
 - 1. Model number.
 - 2. Serial number.
 - 3. Performance characteristics.
- C. Manufacturer's Nameplates, Trademarks, Logos, and Other Identifying Marks on Products: Not allowed on surfaces exposed to view in public areas, interior or exterior.

1.6 MOCK-UP REQUIREMENTS

- A. Tests will be performed under provisions identified in this Section and identified in individual product Specification Sections.
- B. Assemble and erect specified or indicated items with specified or indicated attachment and anchorage devices, flashings, seals, and finishes.
- C. Accepted mockups shall be comparison standard for remaining Work.
- D. Where mockup has been accepted by Architect/Engineer and is specified in product Specification Sections to be removed, remove mockup and clear area when directed to do so by Architect/Engineer.

1.7 TESTING AND INSPECTION SERVICES

- A. Employ and pay for services of an independent testing agency or laboratory acceptable to Owner to perform specified testing.
 - 1. Before starting Work, submit testing laboratory name, address, and telephone number, and names of full-time Professional Engineer or specialist and responsible officer.
 - 2. Submit copy of report of laboratory facilities' inspection made by Materials Reference Laboratory of National Bureau of Standards during most recent inspection, with memorandum of remedies of deficiencies reported by inspection.
- B. Independent firm will perform tests, inspections, and other services specified in individual Specification Sections and as required by Architect/Engineer or authorities having jurisdiction.
 - 1. Laboratory: Authorized to operate in the project's jurisdiction.
 - 2. Laboratory Staff: Maintain full-time Professional Engineer on staff to review services.
 - 3. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to National Bureau of Standards or accepted values of natural physical constants.
- C. Testing, inspections, and source quality control may occur on or off Project Site. Perform off-Site testing as required by Architect/Engineer or Owner.
- D. Reports shall be submitted by independent firm to Architect/Engineer, Contractor, and authorities having jurisdiction, indicating observations and results of tests and compliance or noncompliance with Contract Documents.
 - 1. Submit final report indicating correction of Work previously reported as noncompliant.
- E. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
 - 1. Notify Architect/Engineer and independent firm 48 hours before expected time for operations requiring services.
 - 2. Make arrangements with independent firm and pay for additional Samples and tests required for Contractor's use.
- F. Employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work according to requirements of Contract Documents.
- G. Retesting or re-inspection required because of nonconformance with specified or indicated requirements shall be performed by same independent firm on instructions from Architect/Engineer. Payment for retesting or re-inspection will be charged to Contractor by deducting testing charges from Contract Sum/Price.
- H. Agency Responsibilities:
 - 1. Test Samples of mixes submitted by Contractor.
 - 2. Provide qualified personnel at Site. Cooperate with Architect/Engineer and Contractor in performance of services.
 - 3. Perform indicated sampling and testing of products according to specified standards.
 - 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 5. Promptly notify Architect/Engineer and Contractor of observed irregularities or nonconformance of Work or products.
 - 6. Perform additional tests required by Architect/Engineer.
 - 7. Attend preconstruction meetings and progress meetings.

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- I. Agency Reports: After each test, promptly submit two copies of report to Architect/Engineer, Contractor, and authorities having jurisdiction. When requested by Architect/Engineer, provide interpretation of test results. Include the following:
 - 1. Date issued.
 - 2. Project title and number.
 - 3. Name of inspector.
 - 4. Date and time of sampling or inspection.
 - 5. Identification of product and Specification Section.
 - 6. Location in Project.
 - 7. Type of inspection or test.
 - 8. Date of test.
 - 9. Results of tests.
 - 10. Conformance with Contract Documents.
- J. Limits on Testing Authority:
 - 1. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Agency or laboratory may not approve or accept any portion of the Work.
 - 3. Agency or laboratory may not assume duties of Contractor.
 - 4. Agency or laboratory has no authority to stop the Work.

1.8 MANUFACTURER'S FIELD SERVICES

- A. When specified in individual Specification Sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe Site conditions, conditions of surfaces and installation, quality of workmanship, as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Architect/Engineer 30 days in advance of required observations. Observer is subject to approval of Architect/Engineer.
- C. Report observations and Site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer's written instructions.
- D. Refer to Section 01 33 00 - Submittal Procedures, "Manufacturer's Field Reports" Article.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 01 40 00

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Temporary facilities under Construction Management Agreement.
- B. Temporary Utilities:
 - 1. Temporary electricity.
 - 2. Temporary lighting for construction purposes.
 - 3. Temporary heating.
 - 4. Temporary cooling.
 - 5. Temporary ventilation.
 - 6. Communication services.
 - 7. Temporary water service.
 - 8. Temporary sanitary facilities.
- C. Construction Facilities:
 - 1. Field offices and sheds.
 - 2. Vehicular access.
 - 3. Parking.
 - 4. Progress cleaning and waste removal.
 - 5. Project identification.
 - 6. Traffic regulation.
 - 7. Fire-prevention facilities.
- D. Temporary Controls:
 - 1. Barriers.
 - 2. Enclosures and fencing.
 - 3. Security.
 - 4. Water control.
 - 5. Dust control.
 - 6. Erosion and sediment control.
 - 7. Noise control.
 - 8. Pest and rodent control.
 - 9. Pollution control.
- E. Removal of utilities, facilities, and controls.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 2. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

3. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

1.3 TEMPORARY ELECTRICITY

- A. Owner will pay cost of energy used. Exercise measures to conserve energy. Use Owner's existing power service.
- B. Complement existing power service capacity and characteristics as required for construction operations.
- C. Provide power outlets with branch wiring and distribution boxes located as required for construction operations. Provide suitable, flexible power cords as required for portable construction tools and equipment.
- D. Provide feeder switch at source distribution equipment.
- E. Permanent convenience receptacles may be used during construction.

1.4 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

- A. Provide and maintain lighting for construction operations to achieve minimum lighting level of 2 watts/sq. ft.
- B. Provide and maintain 0.25 watt/sq. ft. HID lighting to interior work areas after dark for security purposes.
- C. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, lamps, and the like, for specified lighting levels.
- D. Maintain lighting and provide routine repairs.
- E. Permanent building lighting may be used during construction.

1.5 TEMPORARY HEATING

- A. Provide and pay for heating devices and heat as needed to maintain specified conditions for construction operations. Provide separate metering and reimburse Owner for cost of energy used.
- B. Enclose building before activating temporary heat according to "Enclosures and Fencing" Article in this Section.
- C. Before operating permanent equipment for temporary heating purposes, verify installation is approved for operation, equipment is lubricated, and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts. Replace filters at Substantial Completion.
- D. Maintain minimum ambient temperature of 50 degrees F in areas not occupied by the owner where construction is in progress unless indicated otherwise in individual product Sections.

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- E. Maintain minimum ambient temperature of 68 degrees F in areas occupied by the owner where construction is in progress unless indicated otherwise in individual product Sections.

1.6 TEMPORARY COOLING

- A. Provide and pay for cooling devices and cooling as needed to maintain specified conditions for construction operations. Provide separate metering and reimburse Owner for cost of energy used.
- B. Enclose building before activating temporary cooling according to ""Enclosures and Fencing"" Article in this Section.
- C. Before operating permanent equipment for temporary cooling purposes, verify installation is approved for operation, equipment is lubricated, and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts. Replace filters at Substantial Completion.
- D. Limit maximum ambient temperature to 80 degrees F in areas where construction is in progress unless indicated otherwise in individual product Sections.

1.7 TEMPORARY VENTILATION

- A. Ventilate enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- B. Use existing ventilation equipment. Extend and supplement equipment with temporary fan units as required to maintain clean air for construction operations.

1.8 COMMUNICATION SERVICES

- A. Telephone Service: Provide, maintain, and pay for telephone service to field office at time of Project mobilization and until completion of Work.
- B. Facsimile Service: Provide, maintain, and pay for facsimile service including dedicated telephone line to field office at time of Project mobilization and until completion of Work.
- C. Internet Service: Provide, maintain, and pay for broadband Internet service to field office at time of Project mobilization. Provide desktop computer with Microsoft operating system and appropriate office function software, modem, and printer.

1.9 TEMPORARY WATER SERVICE

- A. Owner will pay cost of temporary water. Exercise measures to conserve energy. Use Owner's existing water system, extended and supplemented with temporary devices as needed to maintain specified conditions for construction operations.
- B. Extend branch piping with outlets located so that water is available by hoses with threaded connections. Provide temporary pipe insulation and heat tape to prevent freezing.

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1.10 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Existing facility use is not permitted. Provide facilities at time of Project mobilization.

1.11 FIELD OFFICES AND SHEDS

- A. Designated existing spaces may be used for field offices. Coordinate locations with Owner.
- B. Storage Areas and Sheds: Size to storage requirements for products of individual Sections, allowing for access and orderly provision for maintenance and inspection of products to suit requirements in Section 01 60 00 - Product Requirements.
- C. Preparation: Fill and grade Sites for temporary structures sloped for drainage away from buildings.
- D. Installation:
 - 1. Install field office spaces ready for occupancy 15 days after date established by Owner-Contractor Agreement.
 - 2. Employee Residential Occupancy: Not allowed on Owner's property.
- E. Maintenance and Cleaning:
 - 1. Weekly janitorial services for field offices; periodic cleaning and maintenance for sheds and storage areas.
 - 2. Maintain walks free of mud, water, snow, and the like.
- F. Removal: At completion of Work remove buildings, foundations, utility services, and debris. Restore areas to same or better condition as original condition.

1.12 VEHICULAR ACCESS

- A. Extend and relocate vehicular access as Work progress requires and provide detours as necessary for unimpeded traffic flow.
- B. Provide unimpeded access for emergency vehicles. Maintain 20-foot-wide driveways with turning space between and around combustible materials.
- C. Provide and maintain access to fire hydrants and control valves free of obstructions.
- D. Provide means of removing mud from vehicle wheels before entering streets.
- E. Use designated existing on-Site roads for construction traffic.

1.13 PARKING

- A. Arrange for temporary surface parking areas to accommodate construction personnel.
- B. Locate as approved by Owner.
- C. If Site space is not adequate, provide additional off-Site parking.

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- D. Use of Owner designated areas of existing on-Site streets and driveways used for construction traffic is permitted. Tracked vehicles are not allowed on paved areas.
- E. Use of Owner designated areas of existing parking facilities used by construction personnel is permitted.
- F. Do not allow heavy vehicles or construction equipment in parking areas.
- G. Do not allow vehicle parking on existing pavement.
- H. Permanent Pavements and Parking Facilities:
 - 1. Avoid traffic loading beyond paving design capacity. Tracked vehicles are not allowed.
- I. Maintenance:
 - 1. Maintain traffic and parking areas in sound condition free of excavated material, construction equipment, products, mud, snow, ice, and the like.
 - 2. Maintain existing paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original condition.
- J. Removal, Repair:
 - 1. Remove temporary materials and construction before Substantial Completion.
 - 2. Remove underground Work and compacted materials to depth of 2 feet fill and grade Site as indicated.
 - 3. Repair existing facilities damaged by use, to original condition.
- K. Mud from Site vehicles: Provide means of removing mud from vehicle wheels before entering streets.

1.14 PROGRESS CLEANING AND WASTE REMOVAL

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain Site in clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, before enclosing spaces.
- C. Broom and vacuum clean interior areas before starting surface finishing, and continue cleaning to eliminate dust.
- D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.15 PROJECT IDENTIFICATION

- A. Project Identification Sign:
 - 1. **One** painted sign of construction, design, and content shown on Drawings, location designated.
 - 2. Content:

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- a. Project, title, and name of Owner.
 - b. Names and titles of authorities.
 - c. Names and titles of Architect/Engineer and Consultants.
 - d. Name of Prime Contractor.
 3. Graphic Design, Colors, and Style of Lettering: Designated by Architect/Engineer.
 - B. Project Informational Signs:
 1. Painted informational signs of same colors and lettering as Project identification sign or standard products; size lettering for legibility at 100 -foot distance.
 2. Provide sign at each field office and storage shed, and provide directional signs to direct traffic into and within Site. Relocate as Work progress requires.
 3. Provide municipal traffic agency directional traffic signs to and within Site.
 4. No other signs are allowed without Owner's permission except those required by law.
 - C. Design sign and structure to withstand 60 -mph wind velocity.
 - D. Sign Painter: Experienced as professional sign painter for minimum of three years.
 - E. Finishes, Painting: Adequate to withstand weathering, fading, and chipping for duration of construction.
 - F. Show content, layout, lettering, and color.
 - G. Sign Materials:
 1. Structure and Framing: New wood structurally adequate.
 2. Sign Surfaces: Exterior grade plywood with medium-density overlay, minimum of $\frac{3}{4}$ inches thick, standard large sizes to minimize joints.
 3. Rough Hardware: Galvanized, aluminum, or brass.
 4. Paint and Primers: Exterior quality, two coats; sign background of as selected.
 5. Lettering: Exterior quality paint, contrasting colors as selected.
 - H. Installation:
 1. Install Project identification sign within 15 days after date established by Owner-Contractor Agreement.
 2. Erect at Owner designated location.
 3. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.
 4. Install sign surface plumb and level, with butt joints. Anchor securely.
 5. Paint exposed surfaces of sign, supports, and framing.
 - I. Maintenance: Maintain clean signs and supports; repair deterioration and damage.
 - J. Removal: Remove signs, framing, supports, and foundations at completion of Project and restore area.
- 1.16 TRAFFIC REGULATION
- A. Signs, Signals, and Devices:
 1. Post-Mounted and Wall-Mounted Traffic Control and Informational Signs: As approved by authorities having jurisdiction.

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2. Traffic Cones, Drums, Flares, and Lights: As approved by authorities having jurisdiction.
 3. Flag Person Equipment: As required by authorities having jurisdiction.
- B. Flag Persons: Provide trained and equipped flag persons to regulate traffic when construction operations or traffic encroach on public traffic lanes.
- C. Flares and Lights: Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.
- D. Haul Routes:
1. Consult with authorities having jurisdiction and establish public thoroughfares to be used for haul routes and Site access.
- E. Traffic Signs and Signals:
1. Provide signs at approaches to Site and on Site, at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.
 2. Provide, operate, and maintain traffic control signals to direct and maintain orderly flow of traffic in areas under Contractor's control and areas affected by Contractor's operations.
 3. Relocate signs and signals as Work progresses, to maintain effective traffic control.
- F. Removal:
1. Remove equipment and devices when no longer required.
 2. Repair damage caused by installation.
 3. Remove post settings to depth of 2'-0".

1.17 FIRE-PREVENTION FACILITIES

- A. Prohibit smoking within buildings under construction and demolition. Designate area on Site where smoking is permitted. Provide approved ashtrays in designated smoking areas.
- B. Establish fire watch for cutting, welding, and other hazardous operations capable of starting fires. Maintain fire watch before, during, and after hazardous operations until threat of fire does not exist.
- C. Portable Fire Extinguishers: NFPA 10; 10-pound capacity, 4A-60B: C UL rating.
1. Provide one fire extinguisher at each stairway on each floor of buildings under construction and demolition.
 2. Provide minimum of one fire extinguisher in every construction trailer and storage shed.
 3. Provide minimum of one fire extinguisher on roof during roofing operations using heat-producing equipment.

1.18 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas, to allow for Owner's use of Site, and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades and covered walkways required by authorities having jurisdiction for public rights-of-way and for public access to existing building.

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- C. Tree and Plant Protection: Preserve and protect existing trees and plants designated to remain.
 - 1. Protect areas within drip lines from traffic, parking, storage, dumping, chemically injurious materials and liquids, ponding, and continuous running water.
 - 2. Provide 6-foot-high barriers around drip line, with access for maintenance.
 - 3. Replace trees and plants damaged by construction operations.
- D. Protect non-owned vehicular traffic, stored materials, Site, and structures from damage.

1.19 ENCLOSURES AND FENCING

- A. Construction: Commercial-grade chain-link fence.
- B. Provide 6-foot-high fence around construction Site, at locations coordinated with Owner; equip with vehicular and pedestrian gates with locks.
- C. Exterior Enclosures:
 - 1. Provide temporary insulated weathertight closure of exterior openings to accommodate acceptable working conditions and protection for products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual Specification Sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.
- D. Interior Enclosures:
 - 1. Provide temporary partitions and ceilings at locations requested by owner to separate work areas from Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas, and to prevent damage to existing materials and equipment.
 - 2. Construction: Framing and gypsum board sheet materials with closed joints and sealed edges at intersections with existing surfaces.
 - a. STC rating of 35 according to ASTM E 90.
 - b. Surface-Burning Characteristics: Maximum 25/450 flame-spread/smoke-developed index when tested according to ASTM E 84.
 - c. Fire-Rated Wall Construction: 2-hour rating.
 - 1) Tested Rating: Determined according to ASTM E 119.
 - 3. Paint surfaces exposed to view from Owner-occupied areas.

1.20 SECURITY

- A. Security Program:
 - 1. Protect Work on existing premises and Owner's operations from theft, vandalism, and unauthorized entry.
 - 2. Initiate program in coordination with Owner's existing security system at Project mobilization.
 - 3. Maintain program throughout construction period until Owner's acceptance precludes need for Contractor's security.
- B. Entry Control:
 - 1. Restrict entrance of persons and vehicles to Project Site and existing facilities.
 - 2. Allow entrance only to authorized persons with proper identification.
 - 3. Maintain log of workers and visitors and make available to Owner on request.
 - 4. Coordinate access of Owner's personnel to Site in coordination with Owner's security forces.

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C. Personnel Identification:

1. Provide identification badge for each person authorized to enter premises.
2. Badge to Include: Personal photograph, name, expiration date, and employer.
3. Maintain list of accredited persons and submit copy to Owner on request.
4. Require return of badges at expiration of employment on the Work.

D. Restrictions:

1. Do not allow cameras on Site or photographs taken except by written approval of Owner.
2. All Contractors, Subcontractors, and individuals requiring access to the site are subject to a background check and prior approval of the Owner.
3. Do no work on days indicated in Owner-Contractor Agreement.

1.21 WATER CONTROL

- A. Grade Site to drain. Maintain excavations free of water. Provide, operate, and maintain necessary pumping equipment.
- B. Protect Site from puddles or running water.

1.22 DUST CONTROL

- A. Execute Work by methods that minimize raising dust from construction operations.
- B. Provide positive means to prevent airborne dust from dispersing into atmosphere and into Owner-occupied areas.

1.23 PEST AND RODENT CONTROL

- A. Provide methods, means, and facilities to prevent pests and insects from damaging the Work or entering facility.
- B. Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

1.24 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, and materials before Final Application for Payment inspection.
- B. Remove underground installations to minimum depth of 2'-0".
- C. Clean and repair damage caused by installation or use of temporary Work.
- D. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

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PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 01 50 00

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Products.
- B. Product delivery requirements.
- C. Product storage and handling requirements.
- D. Product options.
- E. Equipment electrical characteristics and components.

1.2 PRODUCTS

- A. At minimum, comply with specified requirements and reference standards.
- B. Specified products define standard of quality, type, function, dimension, appearance, and performance required.
- C. Furnish products of qualified manufacturers that are suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise. Confirm that manufacturer's production capacity can provide sufficient product, on time, to meet Project requirements.
- D. Do not use materials and equipment removed from existing premises except as specifically permitted by Contract Documents.
- E. Furnish interchangeable components from same manufacturer for components being replaced.

1.3 PRODUCT DELIVERY REQUIREMENTS

- A. Transport and handle products according to manufacturer's instructions.
- B. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products; use methods to prevent soiling, disfigurement, or damage.

1.4 PRODUCT STORAGE AND HANDLING REQUIREMENTS

- A. Store and protect products according to manufacturer's instructions.
- B. Store products with seals and labels intact and legible.
- C. Store sensitive products in weathertight, climate-controlled enclosures in an environment suitable to product.
- D. For exterior storage of fabricated products, place products on sloped supports aboveground.
- E. Provide off-Site storage and protection when Site does not permit on-Site storage or protection.
- F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- G. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.
- H. Provide equipment and personnel to store products; use methods to prevent soiling, disfigurement, or damage.
- I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.5 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Products complying with specified reference standards or description.
- B. Products Specified by Naming One or More Manufacturers: Products of one of manufacturers named and complying with Specifications; no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with Provision for Substitutions: Submit Request for Substitution for any manufacturer not named, according to Section 01 25 00 - Substitution Procedures.

PART 2 - PRODUCTS

2.1 EQUIPMENT ELECTRICAL CHARACTERISTICS AND COMPONENTS

- A. Wiring Terminations: Furnish terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Include lugs for terminal box.

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- B. Cord and Plug: Furnish minimum 6-foot long cord and plug including grounding connector for connection to electric wiring system. Cord of longer length may be specified in individual Specification Sections.

PART 3 - EXECUTION - Not Used

END OF SECTION 01 60 00

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SECTION 01 70 00 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Field engineering.
- B. Closeout procedures.
- C. Starting of systems.
- D. Demonstration and instructions.
- E. Testing, adjusting, and balancing.
- F. Project record documents.
- G. Operation and maintenance data.
- H. Manual for materials and finishes.
- I. Manual for equipment and systems.
- J. Spare parts and maintenance products.
- K. Product warranties and product bonds.
- L. Maintenance service.
- M. Examination.
- N. Preparation.
- O. Execution.
- P. Cutting and patching.
- Q. Protecting installed construction.
- R. Final cleaning.

1.2 CLOSEOUT PROCEDURES

- A. Prerequisites to Substantial Completion: Complete following items before requesting Certification of Substantial Completion, either for entire Work or for portions of Work:
 - 1. Submit maintenance manuals, Project record documents, digital images of construction photographs, and other similar final record data in compliance with this Section.

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2. Complete facility startup, testing, adjusting, balancing of systems and equipment, demonstrations, and instructions to Owner's operating and maintenance personnel as specified in compliance with this Section.
3. Conduct inspection to establish basis for request that Work is substantially complete. Create comprehensive list (initial punch list) indicating items to be completed or corrected, value of incomplete or nonconforming Work, reason for being incomplete, and date of anticipated completion for each item. Include copy of list with request for Certificate of Substantial Completion.
4. Obtain and submit releases enabling Owner's full, unrestricted use of Project and access to services and utilities. Include certificate of occupancy, operating certificates, and similar releases from authorities having jurisdiction and utility companies.
5. Deliver tools, spare parts, extra stocks of material, and similar physical items to Owner.
6. Make final change-over of locks and transmit keys directly to Owner. Advise Owner's personnel of change-over in security provisions.
7. Discontinue or change over and remove temporary facilities and services from Project Site, along with construction tools, mockups, and similar elements.
8. Perform final cleaning according to this Section.

B. Substantial Completion Inspection:

1. When Contractor considers Work to be substantially complete, submit to Architect/Engineer:
 - a. Written certificate that Work, or designated portion, is substantially complete.
 - b. List of items to be completed or corrected (initial punch list).
2. Within seven days after receipt of request for Substantial Completion, Architect/Engineer will make inspection to determine whether Work or designated portion is substantially complete.
3. Should Architect/Engineer determine that Work is not substantially complete:
 - a. Architect/Engineer will promptly notify Contractor in writing, stating reasons for its opinion.
 - b. Contractor shall remedy deficiencies in Work and send second written request for Substantial Completion to Architect/Engineer.
 - c. Architect/Engineer will reinspect Work.
 - d. Redo and Inspection of Deficient Work: Repeated until Work passes Architect/Engineer's inspection.
4. When Architect/Engineer finds that Work is substantially complete, Architect/Engineer will:
 - a. Prepare Certificate of Substantial Completion on AIA G704 - Certificate of Substantial Completion, accompanied by Contractor's list of items to be completed or corrected as verified and amended by Architect/Engineer and Owner (final punch list).
 - b. Submit Certificate to Owner and Contractor for their written acceptance of responsibilities assigned to them in Certificate.
5. After Work is substantially complete, Contractor shall:
 - a. Allow Owner occupancy of Project under provisions stated in Certificate of Substantial Completion.
 - b. Complete Work listed for completion or correction within time period stipulated.
6. Owner will occupy portions of building as specified in Section 01 10 00 - Summary.

C. Prerequisites for Final Completion: Complete following items before requesting final acceptance and final payment.

1. When Contractor considers Work to be complete, submit written certification that:
 - a. Contract Documents have been reviewed.
 - b. Work has been examined for compliance with Contract Documents.
 - c. Work has been completed according to Contract Documents.
 - d. Work is completed and ready for final inspection.

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2. Submittals: Submit following:
 - a. Final punch list indicating all items have been completed or corrected.
 - b. Final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 - c. Specified warranties, workmanship/maintenance bonds, maintenance agreements, and other similar documents.
 - d. Accounting statement for final changes to Contract Sum.
 - e. Contractor's affidavit of payment of debts and claims on AIA G706 - Contractor's Affidavit of Payment of Debts and Claims.
 - f. Contractor affidavit of release of liens on AIA G706A - Contractor's Affidavit of Release of Liens.
 - g. Consent of surety to final payment on AIA G707 - Consent of Surety to Final Payment Form.
3. Perform final cleaning for Contractor-soiled areas according to this Section.

D. Final Completion Inspection:

1. Within seven days after receipt of request for final inspection, Architect/Engineer will make inspection to determine whether Work or designated portion is complete.
2. Should Architect/Engineer consider Work to be incomplete or defective:
 - a. Architect/Engineer will promptly notify Contractor in writing, listing incomplete or defective Work.
 - b. Contractor shall remedy stated deficiencies and send second written request to Architect/Engineer that Work is complete.
 - c. Architect/Engineer will reinspect Work.
 - d. Redo and Inspection of Deficient Work: Repeated until Work passes Architect/Engineer's inspection.

1.3 STARTING OF SYSTEMS

- A. Coordinate schedule for startup of various equipment and systems.
- B. Notify Architect/Engineer seven days prior to startup of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.
- D. Verify that tests, meter readings, and electrical characteristics agree with those required by equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute startup under supervision of manufacturer's representative or Contractors' personnel according to manufacturer's instructions.
- G. Submit a written report according to Section 01 33 00 - Submittal Procedures that equipment or system has been properly installed and is functioning correctly.

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1.4 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.
- B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- C. Use operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- D. Demonstrate startup, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at agreed time, at equipment location.
- E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
- F. Required instruction time for each item of equipment and system is specified in individual Specification Sections.

1.5 TESTING, ADJUSTING, AND BALANCING

- A. Owner will appoint, employ, and pay for services of independent firm to perform testing, adjusting, and balancing.

1.6 PROJECT RECORD DOCUMENTS

- A. Maintain on Site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed Shop Drawings, product data, and Samples.
 - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress, not less than weekly.
- E. Specifications: Legibly mark and record, at each product Section, description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates used.
 - 3. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction as follows:

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1. Include Contract modifications such as Addenda, supplementary instructions, change directives, field orders, minor changes in the Work, and change orders.
2. Include locations of concealed elements of the Work.
3. Identify depth of buried utility lines and provide dimensions showing distances from permanent facility components that are parallel to utilities.
4. Dimension ends, corners, and junctions of buried utilities to permanent facility components using triangulation.
5. Identify and locate existing buried or concealed items encountered during Project.
6. Measured depths of foundations in relation to finish floor datum.
7. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
8. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
9. Field changes of dimension and detail.
10. Details not on original Drawings.

G. Submit marked-up paper copy documents to Architect/Engineer before Substantial Completion.

1.7 OPERATION AND MAINTENANCE DATA

- A. Submit in PDF composite electronic indexed file.
- B. Submit data bound in 8-1/2 x 11-inch text pages, three D side ring binders with durable plastic covers.
- C. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS," title of Project, and subject matter of binder when multiple binders are required.
- D. Internally subdivide binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
- E. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- F. Contents: Prepare table of contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:
 1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect/Engineer, Contractor, Subcontractors, and major equipment suppliers.
 2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by Specification Section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Include the following:
 - a. Significant design criteria.
 - b. List of equipment.
 - c. Parts list for each component.
 - d. Operating instructions.
 - e. Maintenance instructions for equipment and systems.
 - f. Maintenance instructions for finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
 - g. Safety precautions to be taken when operating and maintaining or working near equipment.
 3. Part 3: Project documents and certificates, including the following:

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- a. Shop Drawings and product data.
- b. Air and water balance reports.
- c. Certificates.
- d. Originals of warranties.

1.8 MANUAL FOR MATERIALS AND FINISHES

- A. For equipment or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.
- B. Submit one copy of completed volumes before Substantial Completion.
- C. Submit two sets of revised final volumes within ten days after final inspection.
- D. Submit in PDF composite electronic indexed file of final manual within ten days after final inspection.
- E. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations.
- F. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- G. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Include recommendations for inspections, maintenance, and repair.
- H. Additional Requirements: As specified in individual product Specification Sections.
- I. Include listing in table of contents for design data, with tabbed fly sheet and space for insertion of data.

1.9 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.
- B. Submit one copy of completed volumes before Substantial Completion.
- C. Submit two sets of final volumes within ten days after final inspection.
- D. Submit in PDF composite electronic indexed file of final manual within ten days after final inspection.
- E. Each Item of Equipment and Each System: Include description of unit or system and component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and model number of replaceable parts.

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- F. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; by label machine.
- G. Include color-coded wiring diagrams as installed.
- H. Operating Procedures: Include startup, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shutdown, and emergency instructions. Include summer, winter, and special operating instructions.
- I. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- J. Include servicing and lubrication schedule and list of lubricants required.
- K. Include manufacturer's printed operation and maintenance instructions.
- L. Include sequence of operation by controls manufacturer.
- M. Include original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- N. Include control diagrams by controls manufacturer as installed.
- O. Include Contractor's coordination drawings with color-coded piping diagrams as installed.
- P. Include charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- Q. Include list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- R. Include test and balancing reports as specified in Section 01 40 00 - Quality Requirements.
- S. Additional Requirements: As specified in individual product Specification Sections.
- T. Include listing in table of contents for design data with tabbed dividers and space for insertion of data.

1.10 SPARE PARTS AND MAINTENANCE PRODUCTS

- A. Furnish spare parts, maintenance, and extra products in quantities specified in individual Specification Sections.
- B. Deliver to Project Site and place in location as directed by Owner; obtain receipt prior to final payment.

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1.11 PRODUCT WARRANTIES AND PRODUCT BONDS

- A. Obtain warranties and bonds executed in duplicate by responsible Subcontractors, suppliers, and manufacturers within ten days after completion of applicable item of Work.
- B. Execute and assemble transferable warranty documents and bonds from Subcontractors, suppliers, and manufacturers.
- C. Verify documents are in proper form, contain full information, and are notarized.
- D. Co-execute submittals when required.
- E. Include table of contents and assemble in three D side ring binder with durable plastic cover.
- F. Submit prior to final Application for Payment.
- G. Time of Submittals:
 - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
 - 2. Make other submittals within ten days after date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Substantial Completion, submit within ten days after acceptance, listing date of acceptance as beginning of warranty or bond period.

1.12 MAINTENANCE SERVICE

- A. Furnish service and maintenance of components indicated in Specification Sections during warranty period.
- B. Examine system components at frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- C. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by manufacturer of original component.
- D. Do not assign or transfer maintenance service to agent or Subcontractor without prior written consent of Owner.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that existing Site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.

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- B. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.
- C. Examine and verify specific conditions described in individual Specification Sections.
- D. Verify that utility services are available with correct characteristics and in correct locations.

3.2 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance according to manufacturer's instructions.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer-required or -recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

3.3 EXECUTION

- A. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- B. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- C. Verify that field measurements are as indicated on approved Shop Drawings or as instructed by manufacturer.
- D. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
 - 1. Secure Work true to line and level and within specified tolerances, or if not specified, industry-recognized tolerances.
 - 2. Physically separate products in place, provide electrical insulation, or provide protective coatings to prevent galvanic action or corrosion between dissimilar metals.
 - 3. Exposed Joints: Provide uniform joint width and arrange to obtain best visual effect. Refer questionable visual-effect choices to Architect/Engineer for final decision.
- E. Allow for expansion of materials and building movement.
- F. Climatic Conditions and Project Status: Install each unit of Work under conditions to ensure best possible results in coordination with entire Project.
 - 1. Isolate each unit of Work from incompatible Work as necessary to prevent deterioration.
 - 2. Coordinate enclosure of Work with required inspections and tests to minimize necessity of uncovering Work for those purposes.
- G. Mounting Heights: Where not indicated, mount individual units of Work at industry recognized standard mounting heights for particular application indicated.
 - 1. Refer questionable mounting heights choices to Architect/Engineer for final decision.

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2. Elements Identified as Accessible to Handicapped: Comply with applicable codes and regulations.
- H. Adjust operating products and equipment to ensure smooth and unhindered operation.
- I. Clean and perform maintenance on installed Work as frequently as necessary through remainder of construction period. Lubricate operable components as recommended by manufacturer.

3.4 CUTTING AND PATCHING

- A. Employ skilled and experienced installers to perform cutting and patching.
- B. Submit written request in advance of cutting or altering elements affecting:
 1. Structural integrity of element.
 2. Integrity of weather-exposed or moisture-resistant elements.
 3. Efficiency, maintenance, or safety of element.
 4. Visual qualities of sight-exposed elements.
 5. Work of Owner or separate contractor.
- C. Execute cutting, fitting, and patching to complete Work and to:
 1. Fit the several parts together, to integrate with other Work.
 2. Uncover Work to install or correct ill-timed Work.
 3. Remove and replace defective and nonconforming Work.
 4. Remove samples of installed Work for testing.
 5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.
- D. Execute Work by methods to avoid damage to other Work and to provide proper surfaces to receive patching and finishing.
- E. Cut masonry and concrete materials using masonry saw or core drill.
- F. Restore Work with new products according to requirements of Contract Documents.
- G. Fit Work tight to pipes, sleeves, ducts, conduits, and other penetrations through surfaces.
- H. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.
- I. At penetrations of fire-rated walls, partitions, ceiling, or floor construction, completely seal voids with fire-rated material according to Section 078400 – Firestopping, to full thickness of penetrated element.
- J. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for assembly, refinish entire unit.
- K. Identify hazardous substances or conditions exposed during the Work to Architect/Engineer for decision or remedy.

3.5 PROTECTING INSTALLED CONSTRUCTION

- A. Protect installed Work and provide special protection where specified in individual Specification Sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate Work area to prevent damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Use durable sheet materials to protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic from landscaped areas.

3.6 FINAL CLEANING

- A. Execute final cleaning prior to final Project assessment.
 - 1. Employ experienced personnel or professional cleaning firm.
- B. Clean interior and exterior glass and surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces.
- C. Clean equipment and fixtures to sanitary condition with appropriate cleaning materials.
- D. Replace filters of operating equipment.
- E. Clean debris from roofs, gutters, downspouts, and drainage systems.
- F. Clean Site; sweep paved areas, rake clean landscaped surfaces.
- G. Remove waste and surplus materials, rubbish, and construction facilities from Site.

END OF SECTION 01 70 00

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SECTION 02 41 19 - SELECTIVE BUILDING DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Demolishing designated building equipment and fixtures.
 - 2. Demolishing designated construction.
 - 3. Cutting and alterations for completion of the Work.
 - 4. Removing designated items for reuse and Owner's retention.
 - 5. Protecting items designated to remain.
 - 6. Removing demolished materials.

1.2 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Demolition Schedule: Indicate overall schedule and interruptions required for utility and building services.
- C. Shop Drawings:
 - 1. Indicate demolition and removal sequence.
 - 2. Indicate location of items designated for reuse and Owner's retention.
 - 3. Indicate location and construction of temporary work.

1.3 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Accurately record actual locations of capped utilities, concealed utilities discovered during demolition, and subsurface obstructions.
- C. Operation and Maintenance Data: Submit description of system, inspection data, and parts lists.

1.4 QUALITY ASSURANCE

- A. Conform to applicable code for demolition work, dust control, products requiring electrical disconnection and re-connection.
- B. Conform to applicable code for procedures when hazardous or contaminated materials are discovered.
- C. Obtain required permits from authorities having jurisdiction.
- D. Perform Work in accordance with Roseville standard.

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- E. Maintain one copy of each document on site.

1.5 PRE-INSTALLATION MEETINGS

- A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this section.

1.6 SEQUENCING

- A. Section 01 10 00 - Summary: Requirements for sequencing.
- B. Owner will conduct salvage operations before demolition begins to remove materials Owner chooses to retain.

1.7 SCHEDULING

- A. Section 01 32 16 - Construction Progress Schedule: Requirements for scheduling.
- B. Cooperate with Owner in scheduling noisy operations and waste removal that may impact Owners operation and in adjoining spaces.
- C. Coordinate utility and building service interruptions with Owner.
 - 1. Do not disable or disrupt building fire or life safety systems without three days prior written notice to Owner.
 - 2. Schedule tie-ins to existing systems to minimize disruption.
 - 3. Coordinate Work to ensure fire sprinklers, fire alarms, smoke detectors, emergency lighting, exit signs and other life safety systems remain in full operation in occupied areas.

1.8 PROJECT CONDITIONS

- A. Conduct demolition to minimize interference with adjacent and occupied building areas.
- B. Cease operations immediately if structure appears to be in danger and notify Architect/Engineer. Do not resume operations until directed.

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PART 2 - PRODUCTS

2.1 Not Used.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Notify affected utility companies before starting work and comply with their requirements.
- B. Mark location and termination of utilities.
- C. Erect, and maintain temporary barriers and security devices at locations indicated requested by owner, including warning signs and lights, and similar measures, for protection of the public, Owner, and existing improvements indicated to remain.
- D. Layout cuts in post tensioned concrete elements to avoid cutting concrete within 12 inches of any stressing tendon. Notify Architect/Engineer three days in advance of cutting post-tensioned concrete.
- E. Erect and maintain weatherproof closures for exterior openings.
- F. Erect and maintain temporary partitions to prevent spread of dust, odors, and noise to permit continued Owner occupancy.
- G. Prevent movement of structure; provide temporary bracing and shoring required to ensure safety of existing structure.
- H. Provide appropriate temporary signage including signage for exit or building egress.
- I. Do not close or obstruct building egress path.
- J. Do not disable or disrupt building fire or life safety systems without **3** days prior written notice to Owner.

3.2 SALVAGE REQUIREMENTS

- A. Coordinate with Owner to identify building components and equipment required to be removed and delivered to Owner.
- B. Tag components and equipment Owner designates for salvage.
- C. Protect designated salvage items from demolition operations until items can be removed.
- D. Carefully remove building components and equipment indicated to be salvaged.
- E. Disassemble as required to permit removal from building.
- F. Package small and loose parts to avoid loss.

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- G. Mark equipment and packaged parts to permit identification and consolidation of components of each salvaged item.
- H. Prepare assembly instructions consistent with disassembled parts. Package assembly instructions in protective envelope and securely attach to each disassembled salvaged item.
- I. Deliver salvaged items to Owner. Obtain signed receipt from Owner.

3.3 DEMOLITION

- A. Conduct demolition to minimize interference with adjacent and occupied building areas.
- B. Maintain protected egress from and access to adjacent existing buildings at all times.
- C. Do not close or obstruct roadways or sidewalks without permits.
- D. Cease operations immediately when structure appears to be in danger and notify Architect/Engineer.
- E. Disconnect and remove utilities within demolition areas.
- F. Cap and identify abandoned utilities at termination points when utility is not completely removed. Annotate Record Drawings indicating location and type of service for capped utilities remaining after demolition.
- G. Demolish in orderly and careful manner. Protect existing improvements, and supporting structural members.
- H. Carefully remove building components indicated to be reused.
 - 1. Disassemble components as required to permit removal.
 - 2. Package small and loose parts to avoid loss.
 - 3. Mark components and packaged parts to permit reinstallation.
 - 4. Store components, protected from construction operations, until reinstalled.
- I. Remove demolished materials from site except where specifically noted otherwise. Do not burn or bury materials on site.
- J. Remove materials as Work progresses. Upon completion of Work, leave areas in clean condition.
- K. Remove temporary Work.

END OF SECTION 02 41 19

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SECTION 03 00 10 - CONCRETE

PART 1. GENERAL

1.1 RELATED DOCUMENTS

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to Division 1, General Requirements, which are hereby made a part of this specification.

1.2 SECTION INCLUDES

- A. Work included in this section includes furnishing all labor, materials, equipment and incidentals required for complete installation of formwork, reinforcement, accessories, cast-in-place concrete, finishing and curing. This section pertains to building concrete work.
- B. Related work specified elsewhere:
 - 1. Section 03 75 00 – Concrete Rehabilitation

1.3 SUBMITTALS

- A. Comply with ACI 315 "Details and Detailing of Concrete Reinforcement". Indicate reinforcement sizes, spacings, locations, and quantities, bending and cutting schedules, supporting and spacing devices.
- B. See Structural and/or Architectural drawings for General Notes and Special Conditions.
- C. Provide data on joint devices, attachment accessories, mix design for each type concrete, proportions of all ingredients, admixtures, slump range, expected strength and water cement ratio. Provide historical test data with each proposed mix design.

1.4 QUALITY ASSURANCES

- A. Building Code Requirements for Structural Concrete (ACI 318) and latest supplements thereto.
- B. Standard Practice for Selecting Proportions for Normal, Heavy Weight, and Mass Concrete (ACI 211.1).
- C. Hot Weather Concreting (ACI-305R).
- D. Cold Weather Concreting (ACI-306R).
- E. Guide for Measuring, Mixing, Transporting and Placing Concrete (ACI 304R).

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- F. Guide to Curing Concrete (ACI 308R).
- G. Specifications for Structural Concrete (ACI 301).
- H. Guide for Concrete Floor and Slab Construction (ACI 302.1R).
- I. Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete (ASTM C618).
- J. Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type) - (ASTM D994).
- K. Guide to Formwork for Concrete (ACI 347).
- L. Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice.
- M. Design and workmanship of all concrete shall be in accordance with referenced specifications and code listed above. Quality, tolerances, and level of performance of work shall be as specified therein. Contractor shall keep on file, in project office, current copies of all references listed above.

PART 2. PRODUCTS

2.1 FORM MATERIALS

- A. Form Material for Exposed Concrete: Plywood; 5/8" APA B-B polyform Class 1, exterior. Use plywood thickness sufficient to support concrete at temperature and rate of pour. Use only sound, undamaged sheets with clean, true edges. Furnish in largest sizes to minimize joints.
- B. Form Material for Unexposed Concrete: Plywood; 5/8" APA B-B-G-2, exposure 1, exterior, plywood graded per PS-1 standards for construction and industrial plywood. Use plywood thickness sufficient to support concrete at temperature and rate of pour. Use only sound, undamaged sheets with clean, true edges. Lumber shall be standard grade or better.
- C. In lieu of "A" above, the material specified under "B" may be used for exposed concrete if a 3/16" smooth one side, treated, pressed fiberboard liner is utilized.
- D. Lumber for light framing (less than 6" wide): standard grade and species. Framing (6" wider and from 2" to 4" thick): provide No. 1 grade in one of the following species:
 - 1. Douglas Fir (WWPA).
 - 2. Southern Pine (SPIB).
 - 3. Redwood (RIS).

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- E. Prefabricated steel or metal shall be minimum 16 ga. as approved to produce surfaces equal to those specified for wood. Forms shall be matched, tight fitting, and stiffened to support weight of concrete.
- F. Metal Form Deck: Utilized to support exterior slabs; shall be S.D.I. approved and equal to Vulcraft. Spacing of slab reinforcing shall be adjusted if required to match corrugations of metal deck.
- G. Form Ties: Bolt and rod type so designed that upon removal of the form no metal shall be within 1-1/2" of the concrete surface and no holes larger than 1" in diameter. Concrete exposed to the exterior shall utilize galvanized ties.
- H. Waterstops
 - 1. Expansion joints: Purpose made polyvinyl chloride (PVC) or rubber profile and size as indicated on drawings or as required by field conditions, maximum possible lengths as manufactured by Williams, Greenstreak or approved.
 - 2. Construction joints: Inorganic clay material manufactured from Wyoming type, high swelling bentonite as indicated on drawings as manufactured by American Colloid Company or approved.
- I. Dovetail Anchor Slots: Galvanized steel, foam filled, release tape sealed slots, bond tab anchors as manufactured by Heckmann, Hohmann & Barnard, Inc. or approved.
- J. Form Release Agent: Colorless mineral oil which will not stain the concrete or impair natural bonding characteristics of coating intended for use on concrete.
- K. Formed Construction Joints for Slab-on-Grade: Galvanized steel, tongue and groove type profile with knockout holes to receive doweling, min. 26 gage unless noted otherwise. Size and profile as indicated on drawings or as required to fit field conditions.
- L. Slab Edge Joint Filler: ASTM D994, premolded asphaltic board, thickness as indicated or (if not indicated, 1/2" thick minimum).
- M. Vapor Barrier: Vapor/Intrusion Barrier/Fluid Applied Gas Barrier.
 - 1. Acceptable Manufacturers:
 - a. EPRO: Geo Seal System.
 - 1. Refer to Spec Section 025619.13 "Vapor Intrusion Barrier/Fluid Applied Gas Barrier.
- N. Nails, spikes, lag bolts, through bolts, anchorages: Size as required, of sufficient strength and character to maintain formwork in place while

placing concrete.

2.2 REINFORCEMENT MATERIALS

- A. Reinforcing Bars: ASTM A 615 Grade 60 deformed.
- B. Welded Wire Fabric: ASTM A 185, welded steel wire fabric.
- C. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire bar-type supports complying with CRSI specifications.
 - 1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
 - 2. For exposed-to-view concrete surfaces where legs of supports are in contact with forms, provide supports with legs that are protected by plastic (CRSI, Class 1) or stainless steel (CRSI, Class 2).
- D. Inert fiber reinforcement: Polypropylene fiber meeting ASTM-C1116; Fiber mesh, Forta Corporation, or other Architect approved U.L. Listed. Add to plant mixed concrete at a rate of 1.5 lbs. per cubic yard of mix.

2.3 CONCRETE MATERIALS

- A. Cement; controlling specification for Portland Cement, ASTM C150, Type I-Normal or Type II.
- B. Aggregates shall conform to ASTM C-33. Maximum size of aggregate shall not be larger than 1/5 of narrowest dimension between forms of member for which concrete is to be used, nor larger than 3/4 of minimum clear spacing between reinforcing bars, nor larger than 1/3 of slab depth.
- C. Lightweight aggregates shall conform to ASTM C 330.
- D. Water: Clean and potable.
- E. Air Entrainment Admixture: ASTM C260, as manufactured by Master Builders, Euclid, or W.R. Grace.
- F. Chemical Admixtures: ASTM C494; Type 'A' - water reducing; Type 'B' - retarding, Type 'C' - accelerating, Type 'D' - water reducing and retarding, Type 'E' - water reducing and accelerating, Type 'F' - water reducing high range; Type 'G' - water reducing high range and retarding. Calcium chloride or admixtures containing more than .05 percent chloride ions by weight of

admixture shall not be used. Each admixture shall not contribute more than 5 ppm by weight, of chloride ions to the total concrete constituent. Use admixtures in strict compliance with manufacturer's directions.

- G. Fly Ash: ASTM C618, Type 'C' or 'F'.
- H. Bonding Agent: Refer to Spec Section 03300 "Bonding Agents for Concrete".
- I. Non-Shrink Grout: Non-shrink type, pre-mixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents. Capable of developing a minimum compressive strength of 7000 psi at 28 days.
- J. Adhesive Anchoring: Injectable adhesive or self-contained capsule as manufactured by:
 - 1. 'Hilti' HIT System, or Architect approved/reviewed equal.

2.4 CURING COMPOUNDS & SEALERS

- A. Curing Compound/Sealer: Liquid curing compound, water base, concrete curing-sealing compound, VOC (volatile organic content) compliant, containing fugitive dye that does not leave residue (resin, varnish, wax, etc.). Fugitive dye must disappear in 7 days, as manufactured by:
 - 1. Sonneborn Building Products, Kure-N-Seal W.
 - 2. Dayton Superior Corporation, Safe Cure & Seal (J-18).
 - 3. Burke by EDOCO Spartan-Cote WB Cure Seal Hardener.
 - 4. MasterKure 100W, Master Builders, Inc.
 - 5. Vocomp-20, W.R. Meadows.
- B. Absorptive Mats: Burlap cloth, commercial quality suitable for purpose. Constructed of jute or kenaf, weighing approximately 9 oz. per square yard, complying with AASHTO M182, Class 2.
- C. Moisture retaining cover, complying with ASTM C171; one of the following: waterproof paper, polyethylene film, or polyethylene coated burlap.
- D. Crack Repair Material: Floor slabs - 2 part, 100% solid epoxy adhesive in formulation recommended by manufacturer for application, as manufactured by:
 - 1. W.R. Meadows Reziweld 1000 or Architect approved/reviewed equal.
- E. Concrete Densifier/Hardener/Sealants:
Liquid applied, lithium silicate based concrete hardener/sealer. Manufacturers to include:

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1. Dayton Superior "Pentra-Hard Densifier"
2. WR Meadows "Liqi-Hard Ultra
3. Laticrete (L+M) "L+M Lion Hard"
4. Prosoco "Consolideck LS Premium Concrete Sealer, Hardener and Densifier.
5. Sika "Sikaflorr-956 LD
6. SureCrete "SureCrete LD 1800 Lithium Densifier and Cement Hardener"

2.5 CONCRETE MIX

- A. Mix concrete in accordance with ACI 304 and deliver concrete in accordance with ASTM C94.
- B. Quality working stresses for the design of this project shall be based on specific minimum 28-day compressive strength of concrete or on specified minimum compressive strength at earlier age at which concrete may be expected to receive full load. Provide concrete of the following properties:
 1. Exterior concrete; i.e. entry slabs, ramps, etc. - 4,000 psi. 28-day compressive strength; water-cement ratio, 0.40 maximum (air entrained).
 2. Interior slab on ground – 4,000 psi. 28-day compressive strength; water- cement ratio, 0.44 maximum (non-air entrained).
 3. Footings, walls, supported slabs and all other concrete – 3,000 psi. 28-day compressive strength; water-cement ratio, 0.51 maximum (non-air-entrained), 0.46 maximum (air entrained).
- C. Slump Limits: Proportion and design mixes to result in concrete slump at the point of placement as follows:
 1. Ramps and Sloping Surfaces: Not more than 3".
 2. Reinforced Foundation Systems: Not less than 1" and not more than 4".
 3. All Other Concrete: Not less than 1" & not more than 4".
 4. Concrete containing high-range water-reducing admixture (superplasticizer). Not more than 8 inches after adding admixture to site-verified 2-3 inch slump concrete.
 5. Site added water to increase slump is strictly prohibited.
- D. Proportions of aggregate to cement shall be such as to produce a mixture which will work readily into corners, angles of forms, and around reinforcement without permitting materials to segregate. Excess free water shall not collect on concrete surface.
- E. Fly ash shall not exceed 25% of cement content by weight. No fly ash shall be used in slabs.

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- F. Select admixture proportions for normal weight concrete in accordance with ACI 301, Method 1 and in strict accordance with manufacturer's instructions.
- G. Air Entraining Agent: Use in all exterior concrete exposed to weather; i.e. exposed foundation walls, supported slabs, ramps, etc. Air entrainment shall be accomplished by use of approved additives used in accordance with manufacturer's instructions. Limit air to 4% minimum to 7% maximum.
- H. Adjustment to concrete mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather or other circumstances warrant, as accepted by the Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in work.

PART 3. EXECUTION

3.1 FORMWORK ERECTION

- A. Erect formwork, shoring and bracing to achieve design requirements. Fabricate forms for easy removal without hammering or prying against exposed concrete surfaces.
- B. Provide bracing to ensure stability of formwork.
- C. Apply form release agent to formwork in accordance with manufacturer's instructions, prior to placing for accessories and reinforcement.
- D. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings which are affected by agent.
- E. Clean forms as erection proceeds, to remove foreign matter.
- F. Footings and foundations shall be formed, notched and/or sleeved as indicated to provide for installation of mechanical, electrical or plumbing piping/conduit.
- G. Forms shall conform to shape, lines and dimensions of members as called for, substantially and sufficiently tight to prevent leakage of concrete.
- H. Forms shall be properly braced, and tied together so as to maintain position and shape. Forms for exposed concrete shall be braced so as to provide dimensions called for, and have taped joints.
- I. Construction joints, whether indicated on drawings or not, shall be made or located so as to least impair strength of the structure. Where joint is to be

made, the surface of the concrete shall be thoroughly cleaned and all latency removed. In addition, vertical joints shall be keyed.

3.2 INSERTS, EMBEDDED COMPONENTS, AND OPENINGS

- A. Provide formed openings where required for work to be embedded in and passing through concrete members.
- B. Coordinate work of other Sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors and other inserts.
- C. Install concrete accessories straight, level, and plumb.

3.3 REINFORCEMENT PLACEMENT

- A. Place reinforcement, supported and secured against displacement.
- B. Ensure reinforcing is clean, free of loose scale, dirt, or other foreign coatings.
- C. Provide for continuity of reinforcing around corners in footings and walls. Lap corner bars 30 bar diameters.
- D. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

3.4 PLACING CONCRETE

- A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent. Apply bonding agent in accordance with manufacturer's instructions.
- B. Install vapor intrusion barrier/fluid applied gas barrier under interior slab-on-grade.
 - 1. Installation shall be in accordance with manufacturer's instructions.
 - a. Refer to Spec Section 025619.13 "Vapor Intrusion Barrier/Fluid Applied Gas Barrier" for additional information.
- C. Separate exterior slabs-on-grade from vertical surfaces with ½ inch thick joint

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filler, extended full thickness of slab. Also, provide filler strips at supported slabs and vertical surfaces.

- D. Place concrete continuously between predetermined control and construction joints. Do not break or interrupt successive pours such that cold joints occur. Where applicable, construction joints shall occur at control joint locations, unless noted otherwise.
- E. Concrete slabs on grade shall be constructed of thickness indicated. If thickness is not indicated, provide a minimum thickness of 4". Minimum thickness at pipes embedded in concrete shall not be less than three times o.d. of the pipe. All buried piping shall have been tested before placement of concrete.
- F. Provide interior control joints where called for on drawing as detailed. When interior construction joints occur, they shall also be considered as control joints. Provide sawed groove similar to a control joint at all construction joints.
- G. Concrete shall be conveyed from the mixer to place of final deposit by methods which will prevent separation and loss of material.
- H. All equipment used for transporting equipment shall be cleaned of all debris. Ice shall be removed from all places to be occupied by concrete forms, and masonry fillers shall be thoroughly wetted except where air temperatures are below 40 degrees F.
- I. Equipment for chuting, pumping, pneumatically conveying concrete, shall be such size and design as to insure practically continuous flow of concrete at delivery and without separation of materials.
- J. Concrete shall be deposited as soon as practicable in its final position to avoid segregation due to re-handling, flowing. Concreting shall be carried on at such rate that concrete is at all times plastic and flow readily into space between bars. No concrete that has partially hardened or has been contaminated by foreign materials shall be deposited on work, nor shall re-tempered concrete be used.
- K. Concreting, once started, shall be carried on as a continuous operation until placing of panel or section is completed. Top surface shall be generally level.
- L. All concrete shall be thoroughly compacted by suitable means during operation of placing and shall be thoroughly worked around reinforcement, embedded fixtures, and into corners of forms. Vibrator shall not be used to flow concrete.
- M. Where new concrete is doveled to existing work, drill holes in existing

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concrete, insert steel dowels and pack with non-shrink grout or chemical adhesive. Follow manufacturer's recommendations for installation.

- N. Screed floors slabs-on-grade and concrete base for toppings level, maintaining surface flatness of maximum 1/8 inch in 10 ft.
- O. Construct all concrete site work items to shape, size, thickness and elevations shown. Concrete supported slabs shall be 4" thick on 1" form deck with reinforcing as indicated, unless otherwise shown. Side form all work. Slope surfaces of supported slabs, 1/4" per foot to low side or as directed by Architect/Engineer.
- P. Provide 1/2" bituminous expansion joint filler along all joints where supported slabs abut other walks, building walls, etc.
- Q. Protecting and sealing: Protect concrete supported slabs, ramps, platforms, slabs, etc., from pedestrian traffic for three days after pouring. Concrete shall be cured using two layers of burlap kept wet for minimum of 5 days; or at Contractor's option, he may use sprayed-on compound according to manufacturer's recommendations as approved by Architect. Curing method used shall not discolor original color of concrete, nor shall white liquid curing compound be used.
- R. Provide concrete pads, bases, foundations, etc., as indicated and/or required by mechanical, electrical or other equipment supplier. Set anchor bolts for machine and equipment to templates or measurements provided.

3.5 FORM REMOVAL

- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
- B. Remove formwork progressively and in accordance with code requirements.

3.6 FLOOR FINISHING

- A. Finish concrete floor surfaces in accordance with ACI 301 and ACI 302.
- B. Uniformly spread, screed, and float concrete.
- C. Wood float surfaces which will receive quarry tile or ceramic tile with full bed setting system.
- D. Steel trowel surfaces which will receive carpeting, resilient flooring, seamless flooring, epoxy terrazzo. Scarify floors to receive all thin set quarry or

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ceramic tile. Steel trowel corridor slabs (3 passes) and finish to ACI 302.1R, Class 5 floor.

- E. Maintain surface flatness, with maximum variation of 1/8 inch in 10 ft. Corridor slabs to have overall FF=40, local FF=20.
- F. In areas with floor drain, maintain floor level at walls and pitch surfaces uniformly to drains.
- G. Apply concrete hardener on all floor surfaces not receiving resilient flooring tile, hard tile, carpet, epoxy flooring, etc. Apply in accordance with manufacturer's instructions.
- H. Floor shall be finished without excessive floating. Delay troweling until concrete is sufficiently hard to prevent water working to surface. Bring finish to smooth level surface with minimum troweling possible.
- I. Finishes, other than floors, exposed on exterior or interior shall be formed true, free from marks, irregularities. Remove any loose material, grind all projections, fill any honeycombing or holes, finish smooth. Use carborundum stone to hand rub and provide smooth, even surface where directed.
- J. Thoroughly clean and prepare concrete floors scheduled to receive a densifier/hardener/sealer. Apply in strict accordance with manufacturer's instructions.

3.7 CURING

- A. Place absorptive matting and dampen as required.
- B. Immediately after placement, protect concrete from premature drying.
- C. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
- D. Provisions shall be made for maintaining concrete in moist condition for at least five (5) days after placement, except high early concrete which shall be cured for at least two (2) days.
- E. Cold Weather Requirements:
 - 1. General: Except as modified herein, all work shall be in accordance with ACI 306R.
 - 2. Adequate equipment shall be provided for heating concrete materials

and protecting concrete during freezing or near freezing weather. No frozen materials or materials containing ice shall be used.

F. Weather Conditions:

1. In hot weather, sprinkle and cover all concrete for at least 24 hours longer than specified for normal curing periods. In hot weather work shall be in accordance with ACI 305R.
2. In weather when temperature falls below freezing, and in any event between December 1 and April 1, no concrete shall be poured without adequate frost protection.

3.8 CONCRETE FINISHING

- A. Provide concrete surfaces to be left exposed, concrete walls, columns, etc., with smooth rubbed finish not later than one day after form removal.
1. Moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
 2. Provide $\frac{3}{4}$ " x $\frac{3}{4}$ " beveled edges at corners of exposed concrete

3.9 FIELD QUALITY CONTROL

- A. Inspection and testing shall be performed by an independent firm selected by the Owner and retained by the Construction Manager, in accordance with Division 1.
- B. The Contractor shall notify the Architect/Engineer and the Testing Lab at least five (5) days prior to the commencement of concrete operations.
- C. See Division 1 for inspection and testing allowances.
- D. Specimens shall be molded and cured as per ASTM C31. Three specimens per test, not less than one test for each day's pour, each 50 yards concrete poured, each building unit, or each strength concrete. Specimens shall be laboratory cured.
- E. Specimens shall be tested in accordance with ASTM C39. One specimen shall be tested at 7 days, two at 28 days.

- F. When average strength of laboratory control cylinders fall below required compressive strength, Architect shall have right to order change in proportions and water content for remainder of structure. Architect shall have right to require tests as per ACI Building Code; Chapter 20 where load tests show concrete does not conform with drawings or specifications. Deficiency shall be corrected without additional cost to Owner.
- G. A PDF copy of test reports at 7 days, 28 days, shall be sent directly to the Architect by the Testing Laboratory, with all required information shown.
- H. Slump tests per ASTM C-172 and C-143, minimum of one test for each set of cylinders, or more as conditions warrant. Deliveries exceeding specified slump shall be rejected.

3.10 DEFECTIVE CONCRETE

- A. Modify or replace concrete not conforming to required lines, details and elevations, as directed by the Architect/Engineer.
- B. Failure of concrete topping to bond to substrate (as evidenced by a hollow sound when tapped), or disintegration or other failure of topping to perform as a floor finish, will be considered failure of materials and workmanship. Repair or replace toppings in areas of such failures, as directed.

END OF SECTION 03 00 10

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SECTION 04 01 00 - MAINTENANCE OF MASONRY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Chemical cleaning of decorative masonry
 - 2. Repointing of mortar joints.
- B. Related Requirements:
 - 1. Section 03 01 00 - Maintenance of Concrete: Repair of concrete surfaces.
 - 2. Section 04 05 13 - Masonry Mortaring
 - 3. Section 07 90 00 - Joint Protection: Sealants, sealers, and gaskets for sealing joints.
- C. Repointing:
 - 1. Basis of Measurement: By square foot.
 - 2. Basis of Payment: Includes repointing and cleaning.

1.2 REFERENCE STANDARDS

- A. American Concrete Institute:
 - 1. ACI 530/530.1 - Building Code Requirements and Specification for Masonry Structures.

1.3 PREINSTALLATION MEETINGS

- A. Section 01 30 00 - Administrative Requirements: Requirements for preinstallation meeting.
- B. Convene minimum one week prior to commencing Work of this Section.

1.4 SCHEDULING

- A. Section 01 30 00 - Administrative Requirements: Requirements for scheduling.
- B. Perform cleaning and repointing to exterior masonry at time coordinated with owner.

1.5 SEQUENCING

- A. Section 01 10 00 - Summary: Requirements for sequencing.

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- B. Cleaning may be required before applying tuckpointing efforts to ensure a better match for the new mortar, as existing dirt and stains can make matching the color of old buildings difficult.
- C. Perform repointing before cleaning masonry surfaces. Allow mortar to dry for several hours to a few days for brushing and 7 – 14 days before using liquids.

1.6 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit manufacturer information on cleaning compounds and
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Qualifications Statements:
 - 1. Submit qualifications for manufacturer and applicator.
 - 2. Submit manufacturer's approval of applicator.

1.7 QUALITY ASSURANCE

- A. Perform Work according to ACI 530/530.1.

1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.
- B. Applicator: Company specializing in performing Work of this Section with minimum three years' documented experience and approved by manufacturer.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Storage:
 - 1. Store materials according to manufacturer instructions.
 - 2. Store cleaning materials in manufacturer packaging.
 - 3. Store mortar ingredients in manufacturer packaging, or if delivered loose, with adequate weatherproof covering.

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1.10 AMBIENT CONDITIONS

- A. Section 01 50 00 - Temporary Facilities and Controls: Requirements for ambient condition control facilities for product storage and installation.
- B. Cold Weather Requirements: Comply with ACI 530/530.1 if ambient temperature or temperature of masonry units is less than 40 degrees F (4 degrees C).
- C. Hot Weather Requirements: Comply with ACI 530/530.1 if ambient temperature is greater than 100 degrees F (38 degrees C), or if ambient temperature is greater than 90 degrees F (32 degrees C) with wind velocity greater than 8 mph (13 km/h).

PART 2 - PRODUCTS

2.1 MASONRY RESTORATION AND CLEANING

- A. Manufacturers:
 - 1. American Building Restoration Products, Inc.
 - 2. Diedrich Technologies, Inc.; a Hohmann & Barnard company.
 - 3. Dominion Restoration Products.
 - 4. Dumond Chemicals, Inc.
 - 5. EaCo Chem, Inc.
 - 6. Hydroclean; Hydrochemical Techniques, Inc.
 - 7. Price Research, Ltd.
 - 8. PROSOCO, Inc.
- B. Substitutions: As specified in Section 01 60 00 - Product Requirements

2.2 MATERIALS

- A. Cleaning Agent: detergent cleaner
- B. Mortar Materials: As specified in Sections 04 05 13

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for application examination.
- B. Verify that surfaces to be cleaned and pointed are ready for Work of this Section.

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3.2 PREPARATION

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for application preparation.
- B. Protect elements surrounding Work of this Section from damage or disfiguration.
- C. Immediately remove stains, efflorescence, or other excess resulting from Work of this Section.
- D. Protect roof membrane and flashings from damage by laying ½ inch plywood on roof surfaces over full extent of Work area and traffic route.

3.3 INSTALLATION

- A. Comply with procedures used in approved mockup.
- B. Repointing:
 - 1. Cut out loose or disintegrated mortar in joints to minimum 1/2 inch depth or until sound mortar is reached.
 - 2. Do not use power tools.
 - 3. Do not damage masonry units.
 - 4. When cutting is complete, remove dust and loose material by brushing.
 - 5. Mortaring:
 - a. Premoisten joint and apply mortar as specified in Section 04 05 13 - Masonry Mortaring
 - b. Pack tightly in maximum 1/4 inch layers.
 - c. Form smooth, compact concave joint [to match existing].
 - d. Moist cure for 72 hours.
- C. Cleaning Existing Masonry:
 - 1. Cleaning Detergents:
 - a. Brush, spray or hand wash decorative masonry surface at all locations with detergent.
 - b. Saturate masonry with clean water before and after application of cleaning detergent and flush loose mortar and dirt.
- D. Restoration Cleaning:
 - 1. Clean surfaces and remove large particles with wood scrapers or non-ferrous wire brush.
 - 2. Spray or brush coat type masonry with restoration cleaner mixed into solution identical to solution required for mockup area.
 - 3. Provide second application if required by preliminary test of mockup area.
 - 4. Allow sufficient time for solution to remain on masonry and agitate with soft fiber brush or sponge.
 - 5. Rinse from bottom up with potable water applied at 600 psig and at rate of 4 gpm.

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3.4 CLEANING

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for cleaning.
- B. As Work proceeds and upon completion of Work, remove excess mortar, smears, and droppings.
- C. Clean surrounding surfaces.

END OF SECTION 04 01 00

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SECTION 04 05 13 - MASONRY MORTARING

1.1 SUMMARY

- A. Section Includes: Mortar for masonry.
- B. Related Requirements:
 - 1. Section 04 01 00 - Maintenance of Masonry: Bedding and pointing mortar for masonry restoration Work.
 - 2. Section 04 72 00 – Cast Stone Masonry
- C. American Concrete Institute:
 - 1. ACI 530/530.1 - Building Code Requirements and Specification for Masonry Structures.
- D. ASTM International:
 - 1. ASTM C5 - Standard Specification for Quicklime for Structural Purposes.
 - 2. ASTM C91 - Standard Specification for Masonry Cement.
 - 3. ASTM C91M - Standard Specification for Masonry Cement.
 - 4. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar.
 - 5. ASTM C150 - Standard Specification for Portland Cement.
 - 6. ASTM C150M - Standard Specification for Portland Cement.
 - 7. ASTM C199 - Standard Test Method for Pier Test for Refractory Mortars.
 - 8. ASTM C206 - Standard Specification for Finishing Hydrated Lime.
 - 9. ASTM C270 - Standard Specification for Mortar for Unit Masonry.
 - 10. ASTM C387 - Standard Specification for Packaged, Dry, Combined Materials for Concrete and High Strength Mortar.
 - 11. ASTM C387M - Standard Specification for Packaged, Dry, Combined Materials for Concrete and High Strength Mortar.
 - 12. ASTM C595 - Standard Specification for Blended Hydraulic Cements.
 - 13. ASTM C595M - Standard Specification for Blended Hydraulic Cements.
 - 14. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
 - 15. ASTM C1142 - Standard Specification for Extended Life Mortar for Unit Masonry.
 - 16. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms.
 - 17. ASTM C1329 - Standard Specification for Mortar Cement.
 - 18. ASTM C1329M - Standard Specification for Mortar Cement.
 - 19. ASTM C1357 - Standard Test Methods for Evaluating Masonry Bond Strength.

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1.2 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Samples: Submit two samples of mortar, illustrating mortar color and color range.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Manufacturer Instructions: Submit premixed mortar installation instructions.
- E. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

1.3 QUALITY ASSURANCE

- A. Comply with ACI 530/530.1.

1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.6 AMBIENT CONDITIONS

- A. Section 01 50 00 - Temporary Facilities and Controls: Requirements for ambient condition control facilities for product storage and installation.
- B. Cold Weather Requirements: Comply with ACI 530/530.1 if ambient temperature or temperature of masonry units is less than 40 degrees F (4 degrees C).

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- C. Hot Weather Requirements: Comply with ACI 530/530.1 if ambient temperature is greater than 100 degrees F (38 degrees C) or ambient temperature is greater than 90 degrees F (32 degrees C) with wind velocity greater than 8 mph (13 km/h).

PART 2 - PRODUCTS

2.1 MORTAR

A. Manufacturers:

1. CTS Cement Manufacturing Corporation.
2. Glen-Gery Corporation.
3. Holcim (US) Inc.
4. Lafarge North America Inc.
5. Lehigh Hanson; HeidelbergCement Group.
6. QUIKRETE.
7. Solomon Colors Inc.
8. Southern Grouts & Mortars, Inc.

- B. Substitutions: As specified in Section 016000 - Product Requirements

2.2 MATERIALS

A. Portland Cement:

1. Comply with ASTM C150 (C150M), Type I
2. Color: to be determined

- B. Calcium Chloride: Not allowed.

2.3 MIXES

A. Mortar Mixes:

1. Mortar for Structural Masonry: Comply with ASTM C270, Type N using property specification.
2. Pointing Mortar: Comply with ASTM C270, Type N using property specification.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for application preparation.
- B. Apply bonding agent to existing masonry surfaces.

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C. Mortar Mixing:

1. Thoroughly mix mortar ingredients according to ASTM C270 in quantities needed for immediate use.
2. Achieve uniformly damp sand immediately before mixing process.
3. Add mortar color to achieve uniform mix and coloration.
4. Retemper only within two hours of mixing.

3.2 INSTALLATION

- A. According to ACI 530/530.1.

3.3 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.

B. Testing:

1. Frequency: One set of specified tests for every 5,000 sq. ft. of completed wall area.
2. Mortar Mix: Comply with ASTM C780 for aggregate ratio and water content, air content, consistency, and compressive strength.
3. Flexural Bond Strength of Mortar and Masonry Units:
 - a. Comply with ASTM C1357.
 - b. Test in conjunction with applicable masonry unit Sections.
4. Compressive Strength of Mortar and Masonry:
 - a. Comply with ASTM C1314.
 - b. Test in conjunction with applicable masonry unit Sections.

3.4 ATTACHMENTS

- A. Exterior Masonry Wall: Type N pointing mortar.

END OF SECTION 04 05 13

SECTION 04 72 00 - CAST STONE MASONRY

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

- A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions, hereby made a part of this Section.

- 1. Section includes:

- a. Custom cast stone

1.2 RELATED SECTIONS:

- A. Section 04 05 13 – Masonry Mortaring
- B. Section 07 92 00 – Joint Sealers

1.3 REFERENCES:

- A. ASTM A 615/A 615 M – Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
- B. ASTM A 767/A767M – Zinc-Coated (galvanized) Steel Bars for Concrete Reinforcement.
- C. ASTM C 33 – Concrete aggregates.
- D. ASTM C 39 – Compressive strength of concrete cylinders.
- E. ASTM C 90 – Loadbearing Concrete Masonry Units
- F. ASTM C 140 – Sampling and Testing Concrete Masonry Units and Related Units
- G. ASTM C 150 – Portland Cement
- H. ASTM C 270 – Mortar for Unit Masonry
- I. ASTM C 426 – Linear Drying Shrinkage of Concrete Masonry Units
- J. ASTM C 494 – Chemical Admixtures for Concrete
- K. ASTM C 666 – Resistance of Concrete to Rapid Freezing and Thawing
- L. ASTM C 979 – Pigments for Integrally Colored Concrete
- M. ASTM C 1194 – Compressive Strength of Architectural Cast Stone
- N. ASTM C 1195 – Absorption of Architectural Cast Stone
- O. ASTM C 1364 – Architectural Cast Stone
- P. Cast Stone Institute Technical Manual (current ed.)

1.4 DEFINITIONS:

- A. Cast Stone: An architectural masonry unit manufactured to copy fine grain texture and color of natural cut stone.

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- B. Dry Cast Concrete Products: Manufactured from zero-slump concrete.
- C. Machine Casting Method: Vibratory compaction by machine of earth-moist, zero-slump concrete against rigid mold until it is densely compacted.
- D. Vibrant Dry Hand Tamp Casting Method: Vibratory compaction by hand tamp of earth-moist, zero-slump concrete against rigid mold until it is densely compacted.

1.5 SUBMITTALS:

- A. Comply with Division 1 – Section 01340 “Shop Drawings, Product Data and Samples” for submittal requirements.
- B. Product Data: Submit manufacturer’s Product Data
- C. Shop Drawings: Submit manufacturer’s shop drawings, including profiles, cross sections, modular unit lengths, reinforcement if required, exposed faces, anchors and anchoring method recommendations if required and annotation of cast stone types and location.
- D. Samples: Submit pieces of manufacturer’s cast stone units that represent general range of texture and color proposed to be furnished for project.
- E. Test Results:
 - 1. Submit manufacturer’s test results from cast stone units previously made by manufacturer using materials from same sources proposed for use in project.
 - 2. Submit manufacturer’s test results from plant production testing.
- F. Warranty: Submit manufacturer’s standard warranty.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 - 1. Sufficient plant facilities to provide quality, shapes, quantities, and sizes of cast stone units required without delaying progress of the work.
 - 2. Minimum of 10 years experience in producing masonry units or cast stone.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Delivery:

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1. Deliver cast stone units secured to shipping pallets and protected from damage and discoloration.
2. Provide itemized shipping list.
3. Number each piece individually, as required, to match shop drawings and schedules.

B. Storage

1. Store cast stone units and installation materials in accordance with manufacturer's instructions.
2. Store cast stone units on pallets with non-staining, waterproof covers.
3. Do not double stack pallets.
4. Ventilate units under covers to prevent condensation.
5. Prevent contact with dirt and splashing.

C. Handling:

1. Protect cast stone units, including corners and edges, during storage, handling, and installation to prevent chipping, cracking, staining, or other damage.
2. Handle long units at center and both ends simultaneously to prevent cracking.

1.8 SCHEDULING

- A. Schedule and coordinate production and delivery of cast stone units with unit masonry work.

PART 2 - PRODUCTS

2.1 MANUFACTURER:

- A. RockCast, Division of Reading Rock Inc., 4600 Devitt Drive, Cincinnati, OH 45246. Toll Free (800)482-6466. Phone (513)874-2345. Fax (513)874-2520. Web Site: www.rockcast.com. E-mail: info@rockcast.com
- B. Custom Cast Stone Inc., 734 E. 169th Street, Westfield, Indiana 46074, toll free (888)776-9960 phone (317)896-1700 Fax (317)896-1701
1. C. Custom Stone Works, 32910 Plymouth Road, Livonia, MI 48150 Phone:(734) 427-8158 Fax:(734) 427-8178 Toll free:(877)40-GRANITE.
- C. Royal Stone, 3014 Dietz Road, Williamston, MI 48895. Phone: 517-655-5150, Fax: 517-655-2027, Email: jameyp@royalstoneinc.com
- D. Or Equal as approved by Architect/Owner.

2.2 CUSTOM CAST STONE UNITS

- A. Custom Cast Stone Units; RockCast Custom Cast Stone Series or Custom stone units.
- B. Compliance: ASTM C 1364.
- C. Casting Method: Vibrant dry hand tamp.
- D. Texture: Smooth.
- E. Color: As selected by Architect/Owner from manufacturer's full selection of colors.
- F. Units: As indicated on drawings.
- G. Profiles: As indicated on drawings.
- H. Test Results:
 - 1. Compressive Strength, ASTM C 1194: Greater than 6,500 psi at 28 days.
 - 2. Absorption: ASTM C 1195: 6.0 percent max at 28 days.
 - 3. Linear Shrinkage, ASTM C 426: Less than 0.065 percent.
 - 4. Density, ASTM C 140: Greater than 120 pounds per cubic foot.
 - 5. Freeze-Thaw, ASTM C 666: Less than 4.0 percent.
- I. Curing: Cure in enclosed chamber at 95 percent relative humidity for 24 hours or yard cure for 350° days (i.e. 7 days @ 50°F or 5 days @ 70°F) prior to shipping.
- J. Cast Stone type units, as indicated on drawings.

2.3 CAST STONE MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II. White and/or gray as required to match specified color.
- B. Coarse Aggregate: ASTM C 33, except for gradation. Granite, quartz, or limestone.
- C. Fine Aggregates: ASTM C 33, except for gradation. Manufactured or natural sands.
- D. Pigments: ASTM C 979, except do not use carbon black pigments. Inorganic iron oxide pigments.
- E. Water reducing, retarding, and accelerating admixtures: ASTM C 494.

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- F. Water: Potable.
- G. Reinforcing Bars: ASTM A 615, deformed steel bars. Galvanized when covered with less than 1 ½ inches of material.
- H. Galvanized Coating: ASTM A 767

2.4 TEXTURE AND COLOR

- A. General: Match texture and color of full-size sample on file with Architect.
- B. Texture of surfaces exposed to view:
 - 1. Fine-grained texture similar to natural stone.
 - 2. Approximately equal to approved sample when viewed in direct daylight at 20 feet.
- C. Surface Voids:
 - 1. Size: Maximum 1/32 inch.
 - 2. Density: Less than 3 occurrences per any 1 square inch.
 - 3. Viewing Conditions: Not obvious under direct daylight at 20 feet.
- D. Minor Chipping:
 - 1. Minor chipping resulting from shipping and delivery shall not be grounds for rejection of cast stone units.
 - 2. Minor chips shall not be obvious under direct daylight at 20 feet, as determined by Architect.
- E. Color Variation
 - 1. Viewing Conditions: Compare in direct daylight at 20 feet, between cast stone units of similar age, subjected to similar weathering conditions.

2.5 MORTAR

- A. Mortar: ASTM C 270, Type N, as specified in Section 04100 Mortar & Grout.

2.6 ACCESSORIES

- A. Anchors: Type 304 stainless steel.

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- B. Sealant: As specified in Section 07920.
- C. Cleaner: Prosoco Sure Klean 600 Detergent, or Prosoco Sure Klean Vana Trol as required per brick type.

2.7 FABRICATIONS

- A. Shapes: Unless otherwise indicated on drawings, provide:
 - 1. Suitable wash on exterior sills, copings, projecting courses and units with exposed top surfaces.
 - 2. Drips on projecting units, wherever possible.
- B. Reinforcement: As required to withstand handling stresses.

2.8 TOLERANCES

- A. General: Manufacture cast stone units within tolerances in accordance with Cast Stone Institute Technical Manual, unless otherwise specified.
- B. Cross Section Dimensions: Do not deviate by more than plus or minus 1/8 inch from approved dimensions.
- C. Length of Units: Do not deviate by more than length/360 or plus or minus 1/8 inch, whichever is greater, not to exceed plus or minus 1/4 inch.
- D. Warp, Bow or Twist: Do not exceed length/360 or plus or minus 1/8 inch, whichever is greater.

2.9 PRODUCTION QUALITY CONTROL

- A. Mix Designs: Test new and existing mix designs for compressive strength and absorption before manufacturing cast stone units.
- B. Plant Production Testing: Test compressive strength and absorption from specimens selected at random from plant production. Obtain samples every 500 cubic feet of product produced.
- C. Custom Cast Stone Units: Test in accordance with ASTM C 1194 and C 1195.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine construction to receive cast stone units. Notify Architect and the General Contractor in writing if construction is not acceptable. Do not begin installation until unacceptable conditions have been corrected.
- B. Examine cast stone units before installation. Do not install unacceptable units.

3.2 INSTALLATION

- A. Install cast stone units in conjunction with masonry, as specified in Section 04300 "Unit Masonry Work".
- B. Pull units from multiple cubes during installation to minimize variation in color.
- C. Cut units using motor-driven masonry saws.
- D. Do not use pry bars or other equipment in a manner that could damage cast stone units.
- E. Fill dowel holes and anchor slots completely with mortar or non-shrink grout.
- F. Set cast stone units in full bed of mortar, unless otherwise indicated on the drawings.
- G. Fill vertical joints with mortar.
- H. Make joints 3/8 inch, unless otherwise indicated on the drawings.
- I. Leave head joints in copings and similar units upon for sealant.
- J. Rake mortar joints 3/4 inch for pointing.
- K. Tuck point mortar joints to slight concave profile.
- L. Remove excess mortar immediately.
- M. Remove mortar fins and smears before tooling joints.
- N. Sealant Joints:
 - 1. As specified in Sections 07910 "Joint Fillers and Gaskets" and 07920 "Sealants and Caulking".

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- O. Prime ends of cast stone units, insert properly sized backing rod, and install sealant.
- P. Provide sealant joints at following locations:
 - 1. Cast stone units with exposed tops.
 - 2. Joints at relieving angles.
 - 3. Control and expansion joints.
 - 4. As indicated on the drawings.

3.3 TOLERANCES

A. Installation Tolerances: Comply with Cast Stone Institute Technical Manual.

- 1. Variation from Plumb: Do not exceed 1/8 inch in 5 feet or 1/4 inch in 20 feet or more.
- 2. Variation from Level: Do not exceed 1/8 inch in 5 feet, 1/4 inch in 20 feet, or 3/8 inch maximum.
- 3. Variation in Joint Width: Do not vary joint thickness more than 1/8 inch or 1/4 of nominal joint width, whichever is greater.
- 4. Variation in Plane Between Adjacent Surfaces: Do not exceed 1/8-inch difference between planes of adjacent units or adjacent surfaces indicated to be flush with units.

3.4 CLEANING

- A. Clean exposed units after mortar is thoroughly set and cured.
- B. Wet surfaces before applying cleaner.
- C. Apply cleaner to cast stone units in accordance with cleaner manufacturer's instructions.
- D. Perform test of cleaner on small area and receive approval by Architect before full cleaning.
- E. Do not use the following to clean cast stone units:
 - 1. Muriatic acid.

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2. Power washing.

3. Sandblasting.

F. Harsh cleaning materials or methods that would damage or discolor surfaces.

3.5 REPAIR

A. Repair chips and other surface damage noticeable when viewed in direct daylight at 20 feet.

B. Repair with touchup materials provided by manufacturer in accordance with manufacturer's instructions.

C. Repair methods and results to be approved by Architect.

3.6 INSPECTION AND ACCEPTANCE

A. Inspect completed installation in accordance with Cast Stone Institute Technical Manual.

3.7 PROTECTION

A. Protect installed cast stone from splashing, stains, mortar, and other damage.

END OF SECTION 04 72 00

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SECTION 07 31 00 - SHINGLE ROOFING

PART 1 - GENERAL

1.1 SUMMARY:

- A. Section Includes:
 - 1. Roof shingles
 - 2. Related metal flashing
 - 3. Edge Drips

1.2 QUALITY ASSURANCE:

- A. Installer: A firm with (3) years of prior successful experience with installation of roofing of type and scope equivalent to work of this section.
- B. Comply with the requirements of local and state building codes.
- C. SMACNA Details: Except as otherwise shown or specified, comply with applicable recommendations and details of "Architectural Sheet Metal Manual" by SMACNA. Conform to dimensions and profiles shown.

1.3 SUBMITTALS:

- A. Product Data:
 - 1. Submit (2) sets of samples to show the full range of exposed color and texture to be expected in the completed work. Architect's review will be for color and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING:

- A. Store and handle in accordance with manufacturer's recommendations.

1.5 JOB CONDITIONS:

- A. Do not apply roofing including felt when substrate is wet.

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- B. Do not apply shingles when air temperature is below 40 degrees F.

1.6 WARRANTY:

- A. Certain Teed Landmark Pro Lifetime Limited Warranty.

1.7 UNIT PRICES

- A. Quote unit prices for the removal and replacement of damaged exterior roof sheathing - \$/sheet.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Roof Shingles:

1. Three-Dimensional Glass fiber mat base Shingles: ceramically colored algae resistant granules across entire face, two-piece laminated shingles complying with ASTM D 3018, Type 1 and D3462. Provide shingles bearing UL790 Class "A" external fire exposure label and Wind Resistant test requirements of ASTM D3161 (Type 1)/UL 997. Color as selected by Architect from manufacturer's full color range.
2. Products: Subject to compliance with requirements, provide the following:
 - a. CertainTeed Landmark Pro

B. Ridge Shingles:

1. Use factory precut units that corresponds to shingles being installed.

C. Felt:

1. Provide (2) layers of 15 pound asphalt saturated, organic, un-perforated, ASTM D 226-81.

D. Fasteners:

1. Nails: Hot galvanized or aluminum 11 or 12 ga. barbed shank, 3/8" head, sharp pointed conventional, or sufficient length to penetrate through plywood sheathing. Staples will not be allowed.

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E. Flashing:

1. Zinc-Coated Steel: Provide commercial quality carbon steel sheets with minimum of 0.20% copper complying with ASTM A 526, except provide ASTM A 527 where lock-forming is required; hot-dip galvanized to comply with ASTM A 525, designation G90. Use for counter flashing and closure.
2. Sheet Aluminum: Except as otherwise indicated, provide manufacturer's standard aluminum sheet recommended for general flashing applications ASTM B209; alloy 3003; temper H14; thickness indicated or, if not otherwise indicated, 0.032" (20 B & S gage);
 - a. Form flashing (to profiles indicated on drawings, and) to protect roofing materials from physical damage and shed water.
 - b. Provide drip edge flashing where indicated and where required, preformed of .032 inch aluminum.
 1. Color finish: Metal shall be thoroughly cleaned and pretreated before application. Exposed to view surfaces shall be finished with fluorocarbon coating containing a minimum of 70 percent Kynar 500 resin, 1 mil thick. Custom color shall be Architect selected. A 20-year limited warranty against failure of the finish shall begin when the job is complete.

F. Aluminum Slant Back Roof Exhaust Vent

1. Provide CertainTeed aluminum slant back roof, or similar approved by architect, in locations and quantities shown on drawings.

PART 3 - EXECUTION

3.1 INSPECTION:

- A. Inspect the roof to ensure that work penetrating roof surface has been completed to the extent that roofing can be applied.
- B. Examine surfaces to receive tiles to assure they are rigidly supported, even and clean.
- C. Do not apply materials over wet roof sheathing.
- D. Do not proceed with installation until defects are corrected.

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3.2 INSTALLATION:

- A. Ice & Water Shield: Apply 40 mil meeting ASTM D3767 Method A thick membrane minimum tensile strength 250 psi, per ASTM D412 (die C modified), 250% elongation per ASTM D414 (die C modified) minimum 36" wide Grace Ice & Water Shield as manufactured by GCP Applied Technologies or Architect approved equal. Install per manufacturers specifications.
- E. Felt:
 - 1. Apply two layers of felt parallel with eaves, laying first 19" as starter course, overlapping with 36" second layer.
 - 2. Cover roof with 36" sheets of felt overlapping preceding layer by 19" exposing 17" of underlying sheet.
 - 3. Secure underlayment to deck with sufficient fasteners to hold in place until shingles are applied.
- F. Flashing:
 - 1. Provide metal drip edge at all edges of roof.
- G. Roof Shingles:
 - 1. First Course: Start with a full shingle even with starter course.
 - 2. Second Course: Offset second shingle to the 4-1/2" alignment notch in the first course shingle.
 - 3. Third Course: Offset third shingle to the 7-1/2" alignment notch in the second course shingle.
 - 4. Succeeding Courses: Continue this pattern, or any combination of these offsets, to achieve a random appearance.
 - 5. For horizontal alignment, place butt of above shingle at top of 6" horizontal cutout.
 - 6. Fastening Instructions: Place one fastener 1" from each end of shingle and one 12" from each end, four fasteners in each shingle. All four fasteners must be placed in the fastening line.

END OF SECTION 07 31 00

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SECTION 07 71 23 – COMMERCIAL GUTTER SYSTEM

PART I GENERAL

1.1 RELATED DOCUMENTS

- A. The provisions included under Division 0, Bidding and Contract Requirements, and to Division 1, General Requirements are included as part of this section as though bound herein.

1.2 SUMMARY

- A. Provide labor, material, and equipment necessary for furnishing a complete installation of industrial series commercial gutter system.

1.3 SUBMITTALS

- A. Product Data: Each type of product specified. Submit manufacturer's detailed technical product data, installation instructions and recommendations, dimensions of individual components, profiles, and finishes.
- B. Shop Drawings: Show fabrication and installation of industrial series commercial gutter system including fully dimensioned roof plans, expansion joint locations, sections and details of components and other related trims.
- C. Finish & Color Selection: Furnish manufacturer's technical data for custom colors.

1.4 QUALITY ASSURANCE

- A. Where pre-engineered manufactured products are specified, other field fabricated or shop/field fabricated substitutions will not be accepted. However, where shop/field fabrications are indicated pre-engineered systems will be considered with Architect approval.
- B. Obtain all components and related accessories from one single source manufacturer.
- C. Follow manufacturer's printed instructions for installing commercial

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gutter system. Follow primary roofing manufacturer's printed instructions for installing associated roof material for flashing gutter system to roof.

1.5 DELIVERY, STORAGE & HANDLING

- A. All products delivered shall be stored in a clean dry location prior to installation.
- B. Products furnished with strippable protective masking shall not be exposed to direct sunlight for more than 30 minutes without removing masking.
- C. Do not install finished materials with scars or abrasions.

1.6 PRODUCT CONDITIONS

- A. Coordinate work of this Section with adjoining work for proper sequencing to ensure protection from inclement weather and to protect materials and their finish against damage.
- B. Do not install commercial gutter system during inclement weather. When installing in cold climates, warm adhesives, caulks, and primers to at least 50 degrees Fahrenheit prior to application.

1.7 DESIGN PERIMETERS

- A. Commercial Gutter System shall conform to all local building codes and SMACNA design perimeters for architectural sheet metal.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Provide commercial gutter system, accessories, and drainware as manufactured by Perimeter Systems, a division of Southern Aluminum Finishing Company, Inc. 143 Charlotte, Suite 102, Sanford, North Carolina 27330, 1-800-334-9823.

2.2 TYPE

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- A. Provide Perimeter Systems' Industrial Series Commercial Gutter System "Profile G4", 6" size, Model Number G4-R6 or equal approved by architect.

2.3 MATERIALS & FABRICATION

- A. Gutter shall be manufactured from .063" Kynar color to match standing seam roofing system in 10'-0" lengths.
- B. Gutter shall be:
 - 1. Manufactured with 1" telescoping and notched end.
 - 2. Factory punched with fastening holes elongated to allow for thermal movement.
 - 3. Press formed on a CNC press to provide repeated true and accurate profiles.
- C. Support Brackets shall be manufactured from 0.125"x1.00" factory extruded aluminum bar punched for fasteners.
- D. Interior Straps shall be manufactured from 0.125"x 1.00" extruded aluminum (mill finish).

2.4 ACCESSORIES

- A. Mitered Corners, provide factory-mitered corners.
- B. Sculptured End Caps, provide factory end caps at all gutter ends and wall abutments.
- C. Gutter Expansion Joint, provide manufacturer's elastomeric expansion joints with exterior cover plates at 40' intervals or as shown on drawings.

2.5 DRAINWARE

- A. Downspout & Elbows, connect to existing. Where existing is damaged or infeasible, provide rectangular extruded downspout Model Number DS-EX in sizes and locations as indicated on plans. Downspouts shall be manufactured from 1/25 aluminum custom Kynar finished to match gutter fascia. Downspout elbows shall have heliarc welded joints.

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- B. Outlets, at all downspout locations provide aluminum outlets to connect liner to downspout.
- C. Wall Brackets, provide Style 1 Wall brackets at 30" maximum spacing (minimum 2 brackets). Brackets shall be manufactured from 0.125"x1.00" extruded aluminum bar, finished to match downspout.

2.7 FINISHES

- A. General: Apply coatings to exposed aluminum components after fabrication for maximum coating performance and to prevent crazing, abrasion, and damage to finish surfaces.
- B. Pretreatment: Aluminum components shall be pretreated with solutions to remove organic and inorganic surface soils, remove residual oxides, followed by chrome phosphate conversion coating to which organic coatings will firmly adhere.
- C. Coating Type: High Performance Coating, two-coat, shop applied, 70% Polyvinylidene Fluoride (PVDF) coating based on Elf Atochem, Inc. Kynar 500 or Ausimont U.S.A., Inc. Hylar 5000 resin, meeting AAMA 2605 specification.
- D. Color: to be determined from manufacturer's standard colors.

PART 3 EXECUTION

3.1 EXAMINATION

- A. The installer must examine substrates and conditions under which commercial gutter system will be installed. All wood plates and/or fascia boards shall be installed true, straight, and free of splits, cracks, or other irregularities. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 PREPARATION

- A. Prior to the installation of the industrial series commercial gutter system, soffits, extenders, and associated trims shall be installed.

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- B. Installer shall thoroughly read and follow manufacturer's installation instructions before proceeding with installation.

3.3 INSTALLATION

- A. General: The industrial series commercial gutter system shall be installed in strict accordance with manufacturer's printed instructions. Deviations from the instructions are not allowed.
- B. Support Brackets: Layout support brackets to provide $\frac{1}{2}$ " slope in 40 linear feet. Install support brackets with #10 x 2" stainless steel wood screws.
- C. Gutter: Install gutter onto support brackets and fasten to substrates with 1-1/2" aluminum or stainless steel nails. Rivet and seal gutter joints with high grade exterior sealant as recommended by gutter manufacturer.
- D. Expansion Joints: Install elastomeric expansion joints as shown on plans and/or shop drawings. Maximum expansion joint spacing shall be 40' centers.
- E. Install interior straps by fully engaging them into liner and fascia, complete by securely riveting.

END OF SECTION 07 71 23

SECTION 07 92 00 – JOINT SEALANTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to Division 1, General Requirements, which are hereby made a part of this Section.

1.02 DESCRIPTION OF WORK:

- A. The extent of each type of sealant and caulking work is indicated on the drawings and by provisions of this section.
- B. The required applications of sealants and caulking include, but are not necessarily limited to, the following general locations:
 - 1. Flashing reglets and retainers.
 - 2. Masonry control joints, exterior and interior.
 - 3. Interior sound-sealed and air-sealed joints.
 - 4. Flooring joints.
 - 5. Isolation joints, between structure and other elements.
 - 6. Joints at penetrations of walls, decks and floors by piping and other services and equipment.
 - 7. Joints between items of equipment and other construction.
 - 8. Joints between dissimilar materials.

1.03 QUALITY ASSURANCE:

- A. Manufacturers: Firms with not less than 5 years of successful experience in production of types of sealants and caulking compounds required for this project.
 - 1. Obtain elastomeric sealants from a manufacturer which will, upon request, send a qualified technical representative to the project site for purpose of advising installer on proper procedures for use of products.
- B. Installer: A firm with a minimum of 5 years of successful experience in application of types of materials required.

1.04 SUBMITTALS:

- A. Product Data:
 - 1. Submit manufacturer's specifications, recommendations and installation and instructions for each type of sealant, caulking compound and associated miscellaneous material required.
- B. Samples:
 - 1. Submit three, 12" long samples of each color required (except black) for each type of

sealant and caulking compound exposed to view. Install sample between two strips of material similar to or representative of typical surfaces where compound will be used, held apart to represent typical joint widths.

1.05 JOB CONDITIONS:

- A. Pre-Installation Meeting: At General Contractor's direction, installer, sealant manufacturer's technical representative, and other trades involved in coordination with sealant work shall meet with General Contractor at project site to review procedures and time schedule proposed for installation of sealants in coordination with other work. Review each major sealant application required on project.
- B. Weather Conditions: Do not proceed with installation of sealants under adverse weather conditions, or when temperatures are below or above manufacturer's recommended temperature range for installation. Proceed with the work only when forecasted weather conditions are favorable for proper cure and development of high early bond strength. Where joint width is affected by ambient temperature variations, install elastomeric sealants only when temperatures are in lower third of the manufacturer's recommended installation temperature range, so that sealant will not be subjected to excessive elongation and bond stress at subsequent low temperatures. Coordinate time schedule with General Contractor to avoid delay of project.
- C. Statement of Non-Compliance: Where it is necessary to proceed with installation of sealants or caulking compound under conditions which do not fully comply with requirements (because of time schedule or other reasons which the General Contractor determines to be crucial to project), prepare written statement for Owner's record (with copy to Architect) indicating the nature of non-compliance, reasons for proceeding, precautionary measures taken to ensure best possible work and names of individuals concurring with decision to proceed with installation.

1.06 SPECIAL PROJECT WARRANTY (GUARANTEE):

- A. Sealant Warranty: Provide written warranty, signed by the contractor/installer, agreeing to, within warranty period of 10 years (or maximum warranty provided by manufacturer for polyurethane sealants) after date of substantial completion, replace/repair defective materials and workmanship defined to include: Instances of significant leakage of water or air; failures in joint adhesion, material cohesion, abrasion resistance, strain resistance or general durability; failure to perform as required and the general appearance of deterioration in any other manner not clearly specified in manufacturer's published product literature as an inherent characteristic of the sealant material. Warranty includes responsibility for removal and replacement of other work (if any) which conceals or obstructs the replacement of sealants.

PART 2 – PRODUCTS

2.01 MATERIALS, GENERAL:

- A. Colors: Provide black or other natural color where no other standard or custom color is available. Where material is not exposed to view, provide manufacturer's standard color which has best overall performance characteristics for application shown.
 - 1. Provide manufacturer's standard colors as selected by Architect from manufacturer's standard colors.
- B. Hardnesses shown and specified are intended to indicate general range necessary for overall performance. Consult manufacturer's technical representative to determine actual hardness recommended for conditions of installation and use. Upon request, Architect will furnish information concerning anticipated joint movement related to actual joint width and installation temperature. Except as otherwise indicated or recommended, provide compounds within the following range of hardness (Shore A, fully cured, at 75 degrees F.).
 - 1. 5 to 20 for high percentage of movement and minimum exposure to weather and abrasion (including no exposure to vandalism).
 - 2. 15 to 35 for moderate percentage of movement and moderate exposure to weather and abrasion.
 - 3. 30 to 60 for low percentage of movement and maximum exposure to weather and abrasion (including foot traffic on horizontal joints).
- C. Modulus of Elasticity: For joints subjected to movement, either thermal expansion or dynamic movement, select sealants from among available variations which have lowest modulus of elasticity which is consistent with exposure to abrasion or vandalism. For horizontal joints subject to traffic, select sealants with high modulus of elasticity as required to withstand indentation by stiletto heels. Comply with manufacturer's recommendations where no other requirements are indicated.
- D. Compatibility: Before selection and purchase of each specified sealant, investigate its compatibility with joint surfaces, joint fillers and other materials in joint system. Provide only materials (manufacturer's recommended variation of specified materials) which are known to be fully compatible with actual installation conditions as shown by manufacturer's published data or certification.

2.02 SEALANTS:

- A. One Part Elastomeric Sealant (Silicone)
 - 1. One component elastomeric sealant, complying with ASTM C 920, Class 25, Type NS (nonsag), unless Type S (self-leveling) recommended by manufacturer for the application shown.
 - a. Acceptable Standard
 - 1. "Pecora 864 Architectural Silicone Sealant; Pecora Corp.
 - 2. Dow Corning 791; Dow Corning Corp.

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3. Silpruf; General Electric
 4. Omniseal; Sonneborn Building Products, Inc.
 5. Spectrem 2; Tremco Mfg. Co.
 2. One-Component mildew resistant silicone sealant: (Around countertops and backsplashes and other wet interior locations).
 - a. Acceptable Standard
 1. Rhodorsil 6B white; Rhone-Poulenc Inc.
 2. Dow Corning 786; Dow Corning Corp.
 3. Sanitary 1700; General Electric
 3. One Component high movement joints (+100/-50): Where locations of high movement are indicated.
 - a. Dow Corning 790; Dow Corning Corp.,
 - b. Spectrem 1; Tremco
- B. Elastomeric Sealant (Polyurethane)
 1. One component polyurethane sealant, complying with ASTM C 920, Type S, Grade NS, Class 25 (nonsag).
 - a. Acceptable Standard
 1. Sonolastic NP 1; Sonneborn Building Products Inc.
 2. Dymonic; Tremco Mfg. Co.
 3. Dynatrol I; Pecora Corp.
 4. Vulkem 921; Mameco
 5. CS 2130; Hilti
 6. Sikaflex 1A; Sika Corp.
 7. Sikaflex 15LM; Sika Corp.
 2. Two Component polyurethane sealant, complying with ASTM C 920, Type M, Grade NS, Class 25 (nonsag).
 - a. Acceptable Standard
 1. Sonolastic NP 2; Sonneborn Building Products Inc.
 2. Dymonic; Tremco Mfg. Co.
 3. Dynatrol II; Pecora Corp.
 4. Vulkem 922; Mameco
 5. Sikaflex LCNSEZ; Sika Corp.
- C. One-part self-leveling polyurethane sealant (for traffic areas).
 1. One Component polyurethane self-leveling sealant, complying with ASTM C 920, Type S, Grade P, Class 25.
 - a. Acceptable Standard
 1. Sonolastic SL 1; Sonneborn Building Products Inc.
 2. NR-201 Urexpan; Pecora Corp.
 3. Vulkem 45; Mameco
 4. Sikaflex 1CSL; Sika Corp.

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2. Two-component polyurethane self-leveling sealant, complying with ASTM C 920, Type M, Grade P, Class 25.
 - a. Acceptable Standard
 1. Sonolastic SL 2; Sonneborn Building Products Inc.
 2. NR-200 Urexpan; Pecora Corp.
 3. Vulkem 245; Mameco
 4. THC900/THC901; Tremco
 5. Sikaflex 2CSL; Sika Corp.
- D. Security Sealant (Polyurethane)
 1. One component or two component polyurethane sealant, complying with ASTM C 920, Grade NS, Class 12.5, with a Shore A Hardness of 55.
 - a. Acceptable Standard
 1. Dynaflex; Pecora Corp.
 2. Ultra; Sonneborn Building Products, Inc.

2.04 CAULKING COMPOUNDS:

- A. Caulking Compounds: (Acrylic Latex Sealant)
 1. Latex rubber modified, acrylic emulsion polymer sealant compound; manufacturer's standard, one part, nonsag, mildew resistant, acrylic emulsion sealant complying with ASTM C 834, formulated to be paintable and recommended for exposed applications on interior locations involving joint movement of not more than plus or minus 5 percent.
 2. Acceptable Standard
 - a. Sonolac, Sonneborn Building Products Inc.
 - b. Acrylic Latex Caulk 834, Tremco Inc.
 - c. Acrylic Latex Caulk with Silicone, DAP
 - d. AC-20, Pecora Corp.

2.05 MISCELLANEOUS MATERIALS:

- A. Joint Cleaner: Provide type of joint cleaning compound recommended by sealant or caulking compound manufacturer, for joint surfaces to be cleaned.
- B. Joint Primer/Sealer: Provide type of joint primer/sealer recommended by sealant manufacturer, for joint surfaces to be primed or sealed.
- C. Bond Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer, to be applied to sealant-contact surfaces where bond to substrate or joint filler must be avoided for proper performance of sealant. Provide self-adhesive tape where applicable.
- D. Sealant Backer Rod: Compressible rod stock polyethylene foam, polyethylene jacketed polyurethane foam butyl rubber foam, neoprene foam or other flexible,

permanent, durable non-absorptive material as recommended for compatibility with sealant by the sealant manufacturer.

- E. Provide size and shape of rod which will control joint depth for sealant placement, break bond of sealant at bottom of joint, form optimum shape of sealant bead on back side, and provide a highly compressible backer to minimize possibility of sealant extrusion when joint is compressed.

PART 3 – EXECUTION

3.01 EXAMINATION:

- A. The installer must examine joint surfaces, backing and anchorage of units forming sealant rabbet and condition under which sealant work is to be performed and notify the General Contractor in writing of conditions detrimental to proper completion of the work and performance by sealants. Do not proceed with sealant work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.02 SELECTION OF MATERIAL

- A. Caulking compounds shall be used for interior nonmoving joints and at locations indicated.
- B. One component elastomeric silicone sealants shall be used at exterior and interior joints where thermal or dynamic movement is anticipated including, but not limited to, the following locations:
 - 1. Metal to metal joints.
 - 2. Sheet metal flashing, coping, preformed metal caps, fascias, extenders, trim and panels.
- C. One or two component elastomeric polyurethane sealants shall be used at exterior and interior joints where weatherproofing or waterproofing is required and at exterior joints between dissimilar materials including, but not limited to, the following locations:
 - 1. Expansion and control joints.
 - 2. Exterior side of hollow metal frames to adjacent materials.
 - 3. Exterior side of aluminum frames to adjacent dissimilar materials.
 - 4. Lintels and shelf angles to masonry construction.
 - 5. Louvers to adjacent construction.
 - 6. Vertical interior expansion joints and horizontal interior and exterior control joints and expansion joints in the building.
 - 7. Joints in concrete site improvements (sidewalks, ramps, retaining walls) and the joint between the concrete slabs and dissimilar materials.
 - 8. Sealant in pipe sleeves where materials must perforate the floor slab.
 - 9. Perimeter of floor slabs or concrete curbs which abut vertical surfaces.

10. Exterior joints between dissimilar materials where the joining of the two surfaces leaves a gap between the meeting materials or components as may be dictated by the various methods of construction to make watertight.
 11. Exterior locations which are noted "caulked" or "sealant" and not specifically listed herein or included in the work of other sections of the Specifications.
 12. Interior joints between dissimilar materials where the joining of the 2 surfaces leave a gap between the meeting materials and components.
- D. One or two part self-leveling polyurethane sealants shall be used for exterior and interior horizontal joints subject primarily to pedestrian traffic and light and moderate vehicular traffic.
- E. Security sealant shall be used in vertical control joints in the interior side of building.

3.03 JOINT SURFACE PREPARATION:

- A. Clean joint surfaces immediately before installation of sealant or caulking compound. Remove dirt, insecure coatings, moisture and other substances which would interfere with bond of sealant or caulking compound.
- B. For elastomeric sealants, do not proceed with installation of sealant over joint surfaces which have been painted, lacquered, waterproofed or treated with a water repellent or other treatment or coating unless a laboratory test for durability (adhesion), in compliance with paragraph 4.3.9. of FS TT-S-00227 has successfully demonstrated that sealant bond is not impaired by coating or treatment. If laboratory test has not been performed or shows bond interference, remove coating or treatment from joint surfaces before installing sealant.
- C. Etch concrete and masonry joint surfaces to remove excess alkalinity, unless sealant manufacturer's printed instructions indicate that alkalinity does not interfere with sealant bond and performance. Etch with 5% solution of muriatic acid; neutralize with dilute ammonia solution, rinse thoroughly with water and allow to dry before sealant installation.
- D. Roughen joint surfaces on vitreous coated and similar non-porous materials, where sealant manufacturer's data indicated lower bond strength than for porous surfaces. Rub with fine abrasive to produce a dull sheen.

3.04 INSTALLATION:

- A. Comply with sealant manufacturer's printed instructions except where more stringent requirements are shown or specified and except where manufacturer's technical representative directs otherwise.
- B. Prime or seal joint surfaces where shown or recommended by sealant manufacturer. Do not allow primer/sealer to spill or migrate onto adjoining surfaces.

- C. Install sealant backer rod for liquid sealants, except where shown to be omitted or recommended to be omitted by sealant manufacturer for the application shown.
- D. Install bond breaker tape where shown and where required by manufacturer's recommendations to ensure that elastomeric sealants will perform properly.
- E. Employ only proven installation techniques, which will ensure that sealants will be deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of joint bond surfaces equally on opposite sides. Except as otherwise indicated, fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces. Where horizontal joints are between a horizontal surface and a vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt.
- F. Install sealants to depths as shown or if not shown as recommended by sealant manufacturer but within the following general limitations, measured at center (thin) section of bead.
 - 1. For sidewalks, pavement and similar joints sealed with elastomeric sealants and subject to traffic and other abrasion and indentation exposures, fill joints to a depth equal to 75% of joint width and neither more than 5/8" deep nor less than 3/8" deep.
 - 2. For normal moving joints sealed with elastomeric sealants, but not subject to traffic, fill joints to a depth equal to 50% of joint width, but neither more than 1/2" deep nor less than 1/4" deep.
 - 3. For joints sealed with non-elastomeric sealants and caulking compounds, fill joints to a depth in the range of 75% to 125% of joint width.
- G. Spillage: Do not allow sealants or compounds to overflow or spill onto adjoining surfaces or to migrate into voids of adjoining surfaces including exposed aggregate panels and similar rough textures. Use masking tape or other precautionary devices to prevent staining of adjoining surfaces but either primer/sealer or the sealant/caulking compound.
- H. Remove excess and spillage of compounds promptly as the work progresses. Clean adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage without damage to adjoining surfaces or finishes.

3.04 CURE AND PROTECTION:

- A. Cure sealants and caulking compounds in compliance with manufacturer's instructions and recommendations to obtain high early bond strength, internal cohesive strength and surface durability. Do not cure in a manner which would significantly alter materials modulus of elasticity or other characteristics.
- B. Installer shall advise the General Contractor of procedures required for curing and protection of sealants and caulking compounds during construction period, so that

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they will be without deterioration or damage (other than normal wear and weathering)
at time of Owner's acceptance.

END OF SECTION 07 92 00

SECTION 09 96 00 - HIGH-PERFORMANCE COATINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: High-performance coatings and special preparation of surfaces. Epoxy Coating systems for concrete floors with decorative chips.
- B. Related Requirements:
 - 1. Section 09 91 00 - Painting and Coating: Preparing, priming, painting, and staining of surfaces.

1.2 REFERENCE STANDARDS

- A. ASTM D 16 - Terminology Relating to Paint, Varnish, Lacquer and Related Products.
- B. SSPC-SP 2 - Hand Tool Cleaning.
- C. SSPC-SP 3 - Power Tool Cleaning.
- D. SSPC-SP 6/NACE 3 - Commercial Blast Cleaning.
- E. SSPC-SP 11 - Power Tool Cleaning to bare metal.
- F. SSPC-SP 13/NACE 6 Surface Preparation of Concrete
- G. ICRI – Concrete Surface Preparation Standards

1.3 PREINSTALLATION MEETINGS

- A. Section 01 30 00 - Administrative Requirements: Requirements for preinstallation meeting.
- B. Convene minimum two week prior to commencing Work of this Section.

1.4 SUBMITTALS

- A. Comply with Section 01 33 00 – Submittal Procedures
- B. Product Data: Submit manufacturer's product data for each coating, including generic description, complete technical data, surface preparation and application instructions.
- C. Color Samples: Submit manufacturer's color samples showing full range of standard colors.
- D. Manufacturer's Quality Assurance: Submit manufacturer's certification that coatings comply with specified requirements and are suitable for intended application.
- E. Applicator's Quality Assurance: Submit list of a minimum of 5 completed projects of similar size and complexity to this Work. Include for each project:
 - 1. Project name and location.
 - 2. Name of owner.
 - 3. Name of contractor.
 - 4. Name of architect.
 - 5. Name of coating manufacturer.
 - 6. Approximate area of coatings applied.
 - 7. Date of completion.
- F. Warranty: Submit manufacturer's standard warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

- B. Operation and Maintenance Data: Submit maintenance and cleaning requirements for coatings, repair and patching techniques.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for maintenance materials.
- B. Extra Stock Materials:
 - 1. Furnish 1 gal. of each color specified, for Owner's maintenance use.
 - 2. Label each container with manufacturer's name, product number, color number, and room names and numbers where used.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Container Labeling: Include manufacturer's name, type of coating, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Inspection:
 - 1. Accept materials on Site in manufacturer's sealed and labeled containers.
 - 2. Inspect for damage and to verify acceptability.
- D. Store materials in ventilated area and otherwise according to manufacturer instructions.
- E. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.8 AMBIENT CONDITIONS

- A. Section 01 50 00 - Temporary Facilities and Controls: Requirements for ambient condition control facilities for product storage and installation.
- B. Minimum Conditions: Do not install materials when temperature is below 55 degrees F or above 90 degrees F
- C. Subsequent Conditions: Maintain above temperature range, 24 hours before, during, and 72 hours after installation of coating.

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- D. Provide lighting level of 80 fc measured mid-height at substrate surface.
- E. Restrict traffic from area where coating is being applied or is curing.

1.9 WARRANTY

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for warranties.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Sherwin Williams High Performance Flooring, Phone (866) 540-6180; Email: coatings@sherwin.com; website: <https://industrial.sherwin-williams.com/na/us/en/resin-flooring.html>. Contact: Mike Fortman, (734) 890-2109, mike.fortman@sherwin.com
- B. PPG High Performance Coatings, 23361 Telegraph Road, Southfield, MI 48034
Contact: Robert Zaleski, Phone: (734) 564-3105. Web Site: www.ppghpc.com
- C. Tnemec Company Incorporated, 6800 Corporate Drive, Kansas City, Missouri 64120-1372. Toll Free (800) 863-6321. Phone (816) 483-3400. Fax (816) 483-3969. Web Site www.tnemec.com. Contact: Trent McNutt, cell (419)346-8795 office (614) 850-8160

2.2 COATING SYSTEMS FOR CONCRETE FLOORS (DECORATIVE CHIP)

- A. Manufacturers:
 - 1. Basis of Design: Torginol
 - a. Colors to be determined by owner and architect.
 - 2. Substitutions: Section 016000 - Product Requirements .
 - 3. Chemical Exposure, Physical Abuse:
 - a. System Type: Modified polyamine epoxy.
 - b. Surface Preparation: SSPC-SP 13/ICRI-CSP 3-5.
- B. Sherwin Williams
 - 1. Prime Coat: Resuprime 3579 at 250-300 sq. ft. per gallon.
 - 2. Body Coat: Resuflor 3746 at 133-160 sq. ft. per gallon.
 - 3. Broadcast: Decorative Flakes 6750 or 6755 to excess at 100-200 lbs. per 1,000 sq. ft.
 - 4. Two Seal Coat: Accelera 4850 at 500-535 sq. ft. per gallon.

C. PPG

1. Prime Coat: MegaSeal HSPC 99-12700 at 8.0 to 10.0 mils
2. Intermediate Coat: MegaSeal SL 99-12600 15.0 to 20.0 mils DFT with complete broadcast to refusal of MegaSeal FLK decorative flake.
3. Finish Coat: MegaSeal SL 99-12600 10.0 to 20.0 mils DFT.

D. Tnemec

1. Surface Preparation: SSPC-SP 13/ICRI-CSP 3-5.
2. Prime Coat: Tnemec Series 237 Power-Tread at 8.0 to 10.0 mils DFT with complete broadcast to refusal of Tnemec Series 224C decorative flake.
3. Intermediate Coat: Tnemec Series 284 deco-clear at 10.0 to 20.0 mils DFT.
4. Finish Coat: Tnemec Series 248 Everthane at 2.0 to 3.0 mils DFT.

2.3 COATING SYSTEMS FOR EXTERIOR STEEL - MODERATE EXPOSURE

A. Sherwin Williams Atmospheric, Chemical, or UV Exposure, Physical Abuse:

1. System Type: Epoxy/urethane.
2. Surface Preparation: Abrasive blast and/or chemically clean.
3. Shop or Field Primer: Macropoxy 646 FC Epoxy Coating DFT 4.0 to 7.0 mils.
4. Field Intermediate Coat: Macropoxy 646 FC Epoxy coatings DFT 4.0 to 7.0 mils.
5. Field Finish Coat: Hi Solids 250 Urethane. DFT 3.0 to 5.0 mils.
6. Total DFT: 11.0 to 19.0 mils.
7. Finish Color: As selected by Architect from manufacturer's standard colors.

B. PPG Atmospheric, Chemical, or UV Exposure, Physical Abuse:

1. System Type: Epoxy/urethane.
2. Surface Preparation: Abrasive blast and/or chemically clean.
3. Shop or Field Primer: Series 97-946 PITT-GUARD® All Weather Direct-To-Rust Epoxy Coatings. DFT 4.0 to 7.0 mils.
4. Field Intermediate Coat: Series 97-946 PITT-GUARD® All Weather Direct-To-Rust Epoxy Coatings. DFT 4.0 to 7.0 mils.
5. Field Finish Coat: Series 95-3300 DURETHANE® DTM Urethane Mastic. DFT 3.0 to 5.0 mils.
6. Total DFT: 11.0 to 19.0 mils.
7. Finish Color: As selected by Architect from manufacturer's standard colors.

C. Tnemec Atmospheric, Chemical, or UV Exposure, Physical Abuse:

1. System Type: Epoxy/urethane.
2. Surface Preparation: SSPC-SP 6/NACE 3.
3. Shop or Field Primer: Series N69 Hi-Build Epoxoline II. DFT 4.0 to 6.0 mils.
4. Field Intermediate Coat: Series N69 Hi-Build Epoxoline II. DFT 2.0 to 3.0 mils.
5. Field Finish Coat: Series 1075 Endura-Shield. DFT 2.0 to 3.0 mils.
6. Total DFT: 8.0 to 12.0 mils.
7. Finish Color: As selected by Architect from manufacturer's standard colors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for application examination.
- B. Substrates:
 - 1. Verify that substrate surfaces are ready to receive Work of this Section as indicated by coating manufacturer.
 - 2. Obtain and follow manufacturer instructions for examination and testing of substrates.
 - 3. Repair cracks and spalling prior to finishing floor.
 - 4. Cementitious Substrates: Do not begin application until substrate has cured minimum 28 days and measured moisture content is not greater than 16 percent.
- C. Masonry: Verify that masonry joints are struck flush.

3.2 PREPARATION

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for application preparation.
- B. Clean surfaces of loose foreign matter.
- C. Remove all surface contamination such as grease and oil from substrate.
- D. Remove substances that would bleed through finished coatings; if removal is not possible, seal surface with shellac.
- E. Remove finish hardware, fixture covers, and accessories and store.
- F. Existing Painted and Sealed Surfaces:
 - 1. Strip existing paint and coatings from surface.
- G. Galvanized Surfaces: Remove surface contamination and oils and wash with solvent.
- H. Ferrous Metal:
 - 1. Solvent clean.
 - 2. Remove loose rust, loose mill scale, and other foreign substances.
 - 3. Hand Tools: Comply with SSPC-SP 2.
 - 4. Power Tools: Comply with SSPC-SP 3.
 - 5. Blasting: Comply with SSPC-SP [6] [7].

3.3 APPLICATION

- A. Comply with MPI - Architectural Painting Manual.
- B. Apply primer to each surface, unless specifically not required by coating manufacturer.
- C. Wood: Prior to priming patch with filler to produce smooth, even surface.
- D. Concrete:
 - 1. Repair cracks and concrete spalls with manufacturer's recommended repair materials as required to produce smooth surface.
- E. Apply coatings to specified thicknesses.
- F. Apply in uniform thickness coats, without runs, drips, pinholes, brush marks, or variations in color, texture, or finish.
 - 1. Finish edges, crevices, corners, and other changes in dimension with full coating thickness.

3.4 FIELD QUALITY CONTROL

- A. Inspector's Services:
 - 1. Verify coatings and other materials are as specified.
 - 2. Verify surface preparation and application are as specified.
 - 3. Verify DFT of each coat and total DFT of each coating system are as specified using wet film and dry film gauges.
 - 4. Coating Defects: Check coatings for film characteristics or defects that would adversely affect performance or appearance of coating systems.
 - a. Check for holidays on interior steel immersion surfaces using holiday detector.
- B. Report:
 - 1. Submit written reports describing inspections made and actions taken to correct nonconforming work.
 - 2. Report nonconforming work not corrected.
 - 3. Submit copies of report to Architect, Owner's Representative and Construction Manager.

- C. Manufacturer's Field Services: Manufacturer's representative shall provide technical assistance and guidance for surface preparation and application of coating systems.

3.5 CLEANING

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for cleaning.
- B. Collect waste material that may constitute fire hazard, place in closed metal containers, and remove daily from Site.
- C. Clean surfaces immediately of overspray, splatter, and excess material.
- D. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.

3.6 PROTECTION

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for protecting finished Work.
- B. Protect adjacent surfaces and materials not receiving coating from overspray.
- C. Mask when necessary to provide adequate protection and repair damage.

3.7 ATTACHMENTS

- A. Colors: Architect to select from manufactures full range of stand flake colors.
- B. Concrete Floors in Apparatus Bay: Clear epoxy floor coating, non-skid finish.
- C. Exterior Steel at Apparatus Bay Door Jambs.

END OF SECTION 09 96 00

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SECTION 31 14 00 - EARTH STRIPPING AND STOCKPILING

PART 1 - GENERAL

1.01 SUMMARY

- A. Provide facilities, labor, materials, tools, equipment, appliances, transportation, supervision, and related work necessary to complete the work specified in this section, and as shown on the Drawings. Work performed under this section includes but is not necessarily limited to:
 - 1. The removal, hauling, and stockpiling of suitable excavated materials for subsequent use in the work. Stockpiling shall include protection to maintain materials in a workable condition.
 - 2. Rehandling, hauling, and placing of stockpiled materials for use in refilling, filling, backfilling, grading, and such other operations.
 - 3. Protect and preserve all existing buildings, pavements, and utilities to remain.
 - 4. Environmental controls.
 - 5. Obtain all required permits, licenses, and approvals of appropriate municipal and utility authorities, prior to commencing the work of this Section, and pay costs incurred.

1.02 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. The cost of all work under this item shall be included in the cost of the Project and no separate payment shall be made therefore unless listed in the Bid Form as a Bid Item.
- B. When listed in the Bid Form as a Bid Item, refer to Section 01 22 00 – Unit Prices – Measurement and Payment.

1.03 REFERENCES

- A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
 - 1. MDOT Current Standards:
 - a. Specifications for Construction.
 - b. Standard Plans.
 - 2. St. Clair County Road Commission (SCCRC) Requirements.
 - 3. The City of Port Huron Requirements.
 - 4. Office of St. Clair County Public Services Requirements.

1.04 DEFINITIONS

- A. Terms:
 - 1. Driving Surface: A pavement, curb, or sidewalk.
 - 2. Excavation:

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- a. Removing the following materials from their present location:
 - 1) Native below-grade material such as soil, boulders less than 1/2 cubic yard in volume, and buried trees.
 - 2) Man-made items such as, but not necessarily limited to:
 - a) Bituminous and concrete paving.
 - b) Curbs.
 - c) Riprap.
 - d) Head walls.
 - e) Underground utilities.
 - f) Manholes and catch basins.
 - g) Foundations.
 - h) Sidewalks.
- 3. Imported Material: Soil material which is purchased by CONTRACTOR and hauled onto the Site.
- 4. Native Material: Soil and other natural earth materials, except rock and boulders of 1/2 cubic yard or more in volume, which are existing on the Site prior to the start of Work.
- 5. Suitable Material:
 - a. Native material excavated from the trench and approved as backfill by ENGINEER.
 - b. Not used under or within 1 on 1 slope of driving surfaces or structures.
 - c. Placed between the top of the bedding or trench backfill as indicated on the Drawings and the bottom of the surface restoration.
- 6. Other Definitions: Other earthwork terms not defined herein or in the Contract Documents shall be as defined in MDOT Standard Specifications for Construction.

1.05 QUALITY ASSURANCE

- A. Material tests and inspection may be made by the ENGINEER or his authorized representative in accordance with Section 01 40 00 "Quality Requirements."

1.06 PROJECT CONDITIONS

- A. Dust Control:
 - 1. Use all legal means necessary to control dust on and near the Work and on and near off-site borrow areas if such dust is caused by CONTRACTOR's operations during performance of the Work or if resulting from the condition of the Site when earthwork operations are suspended.
 - 2. Moisten or otherwise treat haul roads, delivery roads, temporary site access roads and other surfaces as required to prevent dust from being a nuisance to the public, neighbors, and concurrent performance of other work on the Site.
 - 3. Scrape, broom, or vacuum adjacent streets to remove tracked dirt every afternoon, or more as necessary if directed by ENGINEER. Utilize vacuum if dust from brooming is excessive in opinion of ENGINEER.

- B. Existing Structures, Utility Structures, and Utilities:
 - 1. Call MISS DIG to locate existing underground utilities prior to starting excavation.
 - 2. Where utilities, utility structures or structures are encountered which are in active use:
 - a. Provide adequate protection.
 - b. Be responsible for their damage.
 - 3. Provide stand-by utility service if temporary removal is necessary for a period exceeding 2 hours.
 - 4. Where utility service connections to occupied buildings must be temporarily disconnected, give 48 hours' notice to the affected occupants of the time and duration of the anticipated shutoff.
 - 5. Notify Fire Department 48 hours in advance if water main or fire supply line shutoff is required.
 - 6. Raise, lower, or move underground utilities, utility structures or structures which interfere with the utility or utility structure being constructed as part of this Work.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Topsoil shall meet the requirements of Section 31 22 00 "Grading."
- B. Erosion and sedimentation control for stockpiles shall meet the requirements of Section 31 25 00 "Erosion and Sedimentation Control."

PART 3 - EXECUTION

3.01 STRIPPING

- A. Strip all sod, topsoil, subsoil, and other unsuitable soil to its full depth within the Contract limits as shown on the Drawings.
- B. Removal of Sod: Cut to a straight line at the expected excavation limits with sod cutter.
- C. Under pavement areas, unsuitable materials shall be removed and disposed of by the CONTRACTOR in an approved location, or if no approved location exists on site, to an approved off-site location and replaced with structural fill.
- D. Existing onsite material shall be processed to remove all roots, rocks larger than $\frac{3}{4}$ inch in diameter, and other deleterious materials.
- E. Protect the topsoil from contamination by other materials.

3.02 STOCKPILE

- A. After screening, stockpile the topsoil and subsoil material separately. The material shall be stored in locations, and in a manner, approved by the ENGINEER.
- B. No soil stockpile shall exceed fifteen (15) feet in height.
- C. All stockpiles shall be protected from sediment transport by surface roughening, watering, and perimeter silt fencing.
- D. Any topsoil stockpile remaining longer than 30 days shall be seeded to form a temporary cover.
- E. Upon completion of Project or as approved by ENGINEER, remove surplus subsoil and topsoil from the site. Grade stockpile area as necessary for planting and seeding.

END OF SECTION 31 14 00

SECTION 31 22 00 - GRADING

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section covers grading for roadways, driveways, sidewalks, and curbs. This section includes the furnishing and installation of the major items listed below:
 - 1. Excavation in earth and rock.
 - 2. Cutting and filling to balance the work area.
 - 3. Rough and finish grading.
 - 4. Disposal of items from clearing and unsuitable or excess excavated materials.
 - 5. Topsoil.
 - 6. Excess water control.
 - 7. Pavement subgrade preparation.

1.02 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. The cost of all work under this item shall be included in the cost of the Project and no separate payment shall be made therefore unless listed in the Bid Form as a Bid Item.
- B. When listed in the Bid Form as a Bid Item:
 - 1. Pavt, Rem:
 - a. Basis of Measurement: Square yard (SY).
 - b. Basis of Payment: Furnishing all labor, equipment, and material necessary to complete the work described including sawcutting, full depth removal, and disposal of existing bituminous, concrete, composite pavement materials, and aggregate base and subbase materials.
 - 2. Gravel, Rem:
 - a. Basis of Measurement: Square yard (SY).
 - b. Basis of Payment: Furnishing all labor, equipment, and material necessary to complete the work described including removal of gravel surface from the project site at depths and profiles indicated on the Drawings, and disposing of gravel material in the appropriate manner.
 - 3. Curb and Gutter, Rem:
 - a. Basis of Measurement: Linear foot (Ft).
 - b. Basis of Payment: Furnishing all labor, equipment, and material necessary to complete the work described including sawcutting, removal, and disposal of existing concrete curbs, integral curb and gutter, and gutter pans. Also includes removal and disposal of base materials.
 - 4. Sewer, Rem, Less than 24 inch & Dr Structure, Rem:

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- a. Basis of Measurement: Sewer, Rem: Linear foot (Ft).
 - b. Basis of Measurement: Dr Structure, Rem: Each (Ea).
 - c. Basis of Payment: Furnishing all labor, equipment, and material necessary to complete the work described including sawcutting, removal, and disposal of existing concrete curbs, integral curb and gutter, and gutter pans. Also includes removal and disposal of base materials.
5. Undercut:
- a. Basis of Measurement: By cubic yard (CY).
 - b. Basis of Payment: Furnishing all labor, equipment, and material necessary to complete the work described including excavating, hauling, and disposing of the undercut excavated material including the cost of obtaining disposal areas and placing and grading the excavated material on the disposal area.
6. Landscape, Rem:
- a. Basis of Measurement: Lump Sum (LS)
 - b. Basis of Payment: Furnishing all labor, equipment, and material necessary to complete the work described including excavating, hauling, and disposing of all topsoil, mulch, rocks, plant material, and any other material within the landscape removal limits.

1.03 REFERENCES

- A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
- 1. AOAC - Association of Official Agricultural Chemists: Methods of Testing.
 - 2. ASTM Standards:
 - a. D422 - Method for Particle-Size Analysis of Soils.
 - b. D698 - Laboratory Compaction Characteristics of Soil Using Standard Effort.
 - c. D1556 - Density and Unit Weight of Soil In Place by the Sand-Cone Method.
 - d. D1557 - Laboratory Compaction Characteristics of Soil Using Modified Effort.
 - e. D2487 - Classification of Soils for Engineering Purposes.
 - f. D6938 - In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods.
 - 3. MDOT Current Standards:
 - a. Specifications for Construction.
 - b. Standard Plans.
 - 4. St. Clair County Road Commission (SCCRC) Requirements..
 - 5. The City of Port Huron Requirements.
 - 6. St. Clair County Public Services Office Requirements.

1.04 DEFINITIONS

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A. Terms:

1. Driving Surface: A pavement, curb, or sidewalk.
2. Excavation:
 - a. Removing the following materials from their present location:
 - 1) Native below-grade material such as soil, boulders less than 1/2 cubic yard in volume, and buried trees.
 - 2) Man-made items such as, but not necessarily limited to:
 - a) Bituminous and concrete paving.
 - b) Curbs.
 - c) Riprap.
 - d) Head walls.
 - e) Underground utilities.
 - f) Manholes and catch basins.
 - g) Foundations.
 - h) Sidewalks.
3. Fill: Soil, native material, imported material or other material which is placed over the subgrade, or excavated areas; under roadways, parking areas, walks, buildings, or structures; and anywhere else on the Site.
4. Grading: The act of moving soil from one location on the Site to another to achieve the contours and elevations as indicated on the Drawings and as herein specified.
5. Hardpan:
 - a. Cemented soil layers.
 - b. Is not hard clay layers that are not cemented.
6. Imported Material: Soil material which is purchased by CONTRACTOR and hauled onto the Site.
7. Native Material: Soil and other natural earth materials, except rock and boulders of 1/2 cubic yard or more in volume, which are existing on the Site prior to the start of Work.
8. Pavement: Any combination of subbase, base course and concrete, bituminous or aggregate surface course, including shoulders, placed on a subgrade. Includes roadways, parking areas, driveways, sidewalks, and bituminous seal coat.
9. Rock: igneous, metamorphic, or sedimentary rock; hardpan; or other solid material which does not soften when wet; or cannot be excavated without continuous drilling, sawing, blasting, or continuous use of a ripper or other special equipment. This includes all boulders of one-half (1/2) cubic yard or more in volume.
10. Structure: A building, retaining wall, tank, footing, slab, or other similar construction.
11. Subbase: The layer of material placed on the subgrade as part of the pavement structure.
12. Subgrade:
 - a. Below structures and below fill on the Site: The top elevation of the undisturbed native material after all topsoil is stripped off and excavation is completed.

- b. Below driving surfaces: The bottom elevation of the subbase.
- 13. Surface Improvement: All improvements beyond what might be encountered in an open unimproved field.
- 14. Undercut: Excavation of native material from below the bottom of footings, floors, structures, and subbases.
- 15. Utility Structure: Manhole, catch basin, pump station, valve chamber, junction chamber, water main valve, or other similar utility appurtenance.
- 16. Other Definitions: Other earthwork terms not defined herein or in the Contract Documents shall be as defined in MDOT Standard Specifications for Construction.

1.05 QUALITY ASSURANCE

- A. Testing will be performed in accordance with Section 01 40 00 "Quality Requirements."
- B. Compaction:
 - 1. Predominately Granular Soils:
 - a. Density shall be determined by using the modified Proctor method, ASTM D1557.
 - b. Compact fill to at least 95% maximum density.
 - c. The first 12 inches of subgrade below all driving surfaces, structures, utility structures, and fill on the Site:
 - 1) Shall be tested for density.
 - 2) Compact to at least 95% maximum density if the existing density is below 95%.
 - 2. Predominately Cohesive Soils:
 - a. Density shall be determined by using the standard Proctor method, ASTM D698.
 - b. Compact fill to at least 95% maximum density.
 - c. The first 12 inches of subgrade below all driving surfaces, structures, utility structures, and fill on the Site:
 - 1) Shall be tested for density.
 - 2) Compact to at least 95% maximum density if the existing density is below 95%.

1.06 SUBMITTALS

- A. Action Submittals: For imported materials:
 - 1. Source.
 - 2. MDOT classification.
 - 3. Sieve Analysis.

1.07 PROJECT CONDITIONS

- A. Dust Control:
 - 1. Use all legal means necessary to control dust on and near the Work and on and near all off-site borrow areas if such dust is caused by CONTRACTOR's operations during performance of the Work or if resulting from the condition of the Site when earthwork operations are suspended.
 - 2. Treat haul roads, delivery roads, temporary site access roads and other surfaces as required to prevent dust from being a nuisance to the public, neighbors, and concurrent performance of other work on the Site.
 - 3. Scrape, broom, or vacuum adjacent streets to remove tracked dirt every afternoon, or more often as necessary if directed by ENGINEER. Utilize vacuum if dust from brooming is excessive in opinion of ENGINEER.
- B. Existing Structures, Utility Structures, and Utilities:
 - 1. Call MISS DIG to locate all existing underground utilities prior to starting excavation.
 - 2. Where utilities, utility structures, or structures are encountered which are in active use:
 - a. Provide adequate protection.
 - b. Be responsible for repairing any damages to them.
 - 3. Provide stand-by utility service if temporary removal is necessary for a period exceeding 2 hours.
 - 4. Where utility service connections to occupied buildings must be temporarily disconnected, give 48 hours' notice to the affected occupants of the time and duration of the anticipated shut off.
 - 5. Notify Fire Department 48 hours in advance if water main or fire supply line shutoff is required.
 - 6. Raise, lower, or move underground utilities, utility structures, or structures which interfere with the utility, utility structure, or structure being constructed as part of this Work.
- C. Special Filling Requirements:
 - 1. Comply with the regulations of the MDOT, SCCRC, St. Clair County Public Services Office, and railroad company engineering departments with regard to placing fill and compaction in their respective rights-of-way.
 - 2. Obtain necessary permits for filling activities off Site.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. General:
 - 1. Approval Required: All material shall be subject to the approval of the ENGINEER.

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2. Notification: For approval of imported material, notify ENGINEER at least 1 week in advance of intention to import material, designate the proposed borrow area, and permit ENGINEER or his authorized representative to sample as necessary from the borrow area for the purpose of making acceptance tests to prove the quality of the material.
- B. Material Sources and Uses:
1. Imported Material:
 - a. Fill in undercut.
 - b. Fill below structures, utility structures, or driving surfaces.
 - c. Stone stabilization course.
 - d. Fill for special soil construction such as earth berms, earth ponds, soil liners.
 2. Native material, unless quantity is not sufficient; then shall be imported material.
 - a. Fill not below structures, utility structures, or driving surfaces.
 - b. Topsoil.
- C. Fill In Undercut: MDOT 902, Granular Material Class II or MDOT 902 Dense Graded Aggregate 21AA Limestone.
- D. Fill below structures, utility structures, or driving surfaces: MDOT 902, Granular Material Class II.
- E. Stone Stabilization Course:
1. Crushed Stone: 1-1/2 inches maximum size.
 2. Filter Fabric:
 - a. By Mirafi; Amoco; Exxon; Nicolon; or equal.
 - b. Monofilament polypropylene woven fabric.
 - c. Equivalent opening size of 70.
- F. Fill Not Below Structures, Utility Structures, or Driving Surfaces:
1. Native material.
 2. Exclusive of gray or blue clay, peat, organic matter, or frozen lumps.
 3. Containing no rocks or lumps over 3 inches in greatest dimension.
 4. Obtain approval for using native material as fill from ENGINEER.
- G. Topsoil:
1. Fertile, friable soil, containing a minimum of 2.5% and maximum 12% of organic matter as determined by the Loss on Ignition Test, AOAC, with not more than 50% clay and not more than 55% sand as determined in accordance with ASTM D422.
 2. At least 90% of the material shall pass the No. 10 sieve and shall be free of refuse or all material toxic to plant growth, free of subsoil and stumps, roots, brush, stones or similar objects larger than 1-inch diameter.

3. Ordinary sods and herbaceous growth, like grass, need not be removed, but shall be thoroughly broken up and intermixed with soil during handling operations.
 4. Topsoil, unless otherwise specified or approved, shall have, according to Methods of Testing by the AOAC, acidity range of approximately 5.5 pH to 7.6 pH or as approved by ENGINEER prior to delivery.
- H. Fill for Special Soil Construction, Such as Earth Berms, Earth Ponds, Soil Liners, Etc:
1. Clay with a unified soil classification of ML, CL or CH in accordance with ASTM D2487.
 2. Compacted to permeability of 1×10^{-7} cm/sec.

2.02 OTHER MATERIALS

- A. All other materials, not specifically described but required for proper completion of the work of this Section, shall be as selected by CONTRACTOR subject to the approval of ENGINEER.

PART 3 - EXECUTION

3.01 EXCAVATION

- A. Topsoil:
1. Remove all topsoil to depth at which subsoil is encountered, from all areas under buildings, driving surfaces, and from all areas which are to be cut to lower grades or filled.
 2. With ENGINEER's approval, topsoil to be used for finish grading may be stored on the Site.
 3. Other topsoil may be used for fill in noncritical areas with approval of ENGINEER.
- B. Obstructions:
1. Remove and dispose of buried trees, boulders less than 1/2 cubic yard in volume, driving surfaces, pipes and the like, as required for the performance of the Work.
 2. Exercise care in excavating around catch basins, inlets, and manholes.
 3. Avoid removing or loosening castings or pushing dirt into utility structures.
 4. Repair or replace damaged or displaced castings; remove dirt entering utility structures during the performance of the Work at no additional cost to OWNER.
- C. Cutting Paved Surfaces and Similar Improvements:

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1. All cuts shall be a minimum of 1-foot wider than trench on each side. When the remaining width of paved surface is less than 4 feet, remove the entire paved surface.
 2. Before removing pavement, mark the pavement removal area. The pavement removal shall always be perpendicular and/or parallel to the existing pavement joints.
 3. Concrete:
 - a. Pavements: Saw cut if over 3 feet from expansion or construction joint, otherwise remove to joint.
 - b. Sidewalks: Remove to joints.
 - c. Curb and gutter: Remove to joints.
 4. Final surface Course Bituminous: Saw cut joints unless otherwise approved by ENGINEER.
 5. Do not disturb or damage the adjacent pavement. If the adjacent pavement is disturbed or damaged, remove and replace the damaged pavement.
 6. CONTRACTOR may tunnel under curbs that are encountered. Replace curb disturbed by construction.
 7. Dispose of materials removed.
- D. Utilities To Be Abandoned:
1. When pipes, conduits, sewers, or other utilities or utility structures are removed from the excavation leaving dead ends in the ground, fully plug such ends with brick and mortar.
 2. Entirely remove and dispose of abandoned utility structures not identified to be salvaged, unless otherwise specified or indicated on the Drawings.
 3. Remove from the excavation all materials which can be readily salvaged and store at a location designated by OWNER.
 4. All salvageable materials will remain the property of OWNER unless otherwise indicated by OWNER.
- E. Undercut:
1. If soft material, which in the opinion of ENGINEER is not suitable, is encountered below a structure, utility structure, or driving surface, ENGINEER may order the removal of this soft material and its replacement with specified material in order to make a suitable foundation for the construction of the structure, utility structure, or driving surface.
 2. All undercutting made at the order of ENGINEER will be paid for on the basis of the actual quantity of material excavated. Do not proceed further until instructions are received and necessary measurements made for purposes of establishing additional volume of excavation.
 3. No extra payment will be made if removal is required as a result of poor dewatering techniques.
 4. Undercutting which is specifically indicated on the Drawings or herein specified, shall be included in the base Bid.
 5. Soil removed may be used as fill in areas not below driving surfaces, structures, or utility structures.
 6. Compact subgrade at bottom of undercut prior to placing fill.

7. Place and compact specified fill in undercut.
 8. Lateral extent of undercut shall be a horizontal distance equal to the depth of undercut below structure, utility structure, or driving surface.
- F. Excavating:
1. All excavation shall be by open cut from the surface except as herein specified or as indicated on the Drawings.
 2. If required because of excess water conditions, place stone stabilization course prior to proceeding with construction. Place filter fabric over stone stabilization course.
- G. Rock Removal:
1. Where rock is encountered within the excavation, expose the surface of the rock sufficient to permit adequate measurements to be taken before the rock excavation is started.
 2. Notify ENGINEER prior to removal if rock is encountered.
 3. Blasting will not be allowed.
 4. Rock removal shall be paid under separate Change Order unless a specific item appears in the Bid.

3.02 FILL

- A. General:
1. Do not place fill until the subgrade has been examined by ENGINEER.
 2. Place fill in even layers not exceeding 6 inches in depth and thoroughly compact as herein specified.
 3. Do not place additional fill until compaction on a lift complies with specification requirements.
 4. If an analysis of the soil being placed shows a marked difference from 1 location to another, the fill being placed shall not be made up of a mixture of these materials.
 5. Handle each different type of material continuously so that field control of moisture and density may be based upon a known type of material.
 6. Do not place fill following a heavy rain without first making certain on isolated test areas that compaction can be obtained without damage to the already compacted fill.
 7. Do not place fill on frozen subgrade.
- B. Compaction:
1. Select compaction equipment to achieve the required compaction without damaging adjacent structures, utility structures, or driving surfaces.
 2. Suggested Equipment Selections:
 - a. If soil is predominantly granular, use pneumatic tired or vibratory drum rollers loaded to not less than 325 pounds in accordance with rated inch of tire width.
 - b. For clay fills, compact each layer with sheepsfoot rollers. Rollers shall have staggered rows of feet projecting not less than 7 inches

from drum and shall be loaded to produce at least 200 pounds per square inch of tamping area in contact with the ground.

- c. Compact around structures and utility structures with hand operated vibrating compactors for granular soils and Barco rammer type compactors for clay soils.

C. Moisture:

- 1. Compact all fill with the moisture content as specified.
- 2. If fill material is too wet, provide and operate approved means to assist the drying of the fill until suitable for compaction.
- 3. If fill material is too dry, provide and operate approved means to add moisture to the fill layers.

3.03 GRADING

A. General:

- 1. Perform all rough and finish grading required to attain the elevations indicated on the Drawings.
- 2. Perform rough grading to an accuracy of ± 0.10 feet.
- 3. Perform finish grading to an accuracy of ± 0.05 feet.
- 4. Comply with all excavating and fill requirements specified herein during grading operations.

- B. Grading Around Buildings: Control the grading around buildings so the ground is pitched to prevent water from running into the excavated areas of a building or damaging other Site features.

C. Treatment After Completion of Grading:

- 1. After grading is completed, permit no further excavation, filling, or grading, except with the approval of ENGINEER.
- 2. Use all means necessary to prevent the erosion of freshly graded areas during construction and until such time as permanent drainage and erosion control measures have been installed.

- D. Topsoil: All graded areas, outside of buildings and driving surfaces, shall receive 4 inches of topsoil.

3.04 EXCESS WATER CONTROL

- A. Regulations and Permits: Comply with soil erosion control permits in accordance with Mich. P.A. 451, Part 91 of 1994, the Natural Resource and Environmental Protection Act, and all pertinent rules, laws, and regulations.

B. Unfavorable Weather:

- 1. Do not place, spread, or roll any fill material during unfavorable weather conditions.
- 2. Do not resume operations until moisture content and fill density are satisfactory to ENGINEER.

- C. Pumping and Drainage:
 - 1. Provide, maintain, and use at all times during construction adequate means and devices to promptly remove and dispose of all water from every source entering the excavations or other parts of the Work.
 - 2. Dewater by means which will ensure dry excavations, preserve final lines and grades, and do not disturb or displace adjacent soil. Use wells, portable pumps, temporary underdrains or other methods as is necessary.
 - 3. Perform Pumping and Drainage:
 - a. In such a manner to cause no damage to property or structures and without interference to the rights of the public, owners of private property, pedestrians, vehicular traffic, or the work of other CONTRACTORS.
 - b. In accordance with all pertinent laws, rules, ordinances and regulations.
 - 4. Do not overload or obstruct existing drainage facilities.
 - 5. Provide berms or channels to prevent flooding of subgrade. Promptly remove all water collected in depressions.

3.05 DISPOSAL OF EXCESS EXCAVATED MATERIAL

- A. General:
 - 1. Remove and properly dispose of all excavated material not needed to complete filling and grading.
 - 2. Dispose of excess excavated material at a location off the Site.
 - 3. Dispose of excess topsoil at a location off the Site.
 - 4. Disposal of all materials shall not violate laws, rules, regulations and the like regarding the filling of flood plains, wetlands and other environmentally sensitive areas.
 - 5. Provide adequate controls to maintain disposal sites in a neat and safe condition by periodic leveling of material and such other practices as are necessary.
 - 6. Provide all soil erosion control measures necessary to prevent soil erosion and sedimentation of wetlands, rivers, ditches, or similar low lying areas.

3.06 CLEANUP

- A. Upon completion of the work of this Section, remove all excess excavated material, trash, and debris resulting from construction operations. Remove equipment and tools. Leave the Site in a neat and orderly condition acceptable to ENGINEER, and in accordance with Section 01 70 00 "Execution and Closeout Requirements."

END OF SECTION 31 22 00

SECTION 31 23 03 – EXCAVATION AND FILL FOR UTILITIES

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section covers excavation and backfill for the installation of water, storm, sanitary, and other utility systems including pipes and utility structures. This section includes the furnishing and installation of the major items listed below:
 - 1. Excavation and trenching in earth and in rock.
 - 2. Disposal of items from clearing and unsuitable or excess excavated materials.
 - 3. Complete drainage of excavations.
 - 4. Temporary or permanent sheeting, bracing and shoring of excavations.
 - 5. Installation of normal and special foundations, bedding and backfill materials.

1.02 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. The cost of all work under this item shall be included in the cost of the Project and no separate payment shall be made therefore unless listed in the Bid Form as a Bid Item.
- B. When listed in the Bid Form as a Bid Item:
 - 1. Undercut:
 - a. Basis of Measurement: By cubic yard (CY).
 - b. Basis of Payment: Furnishing all labor, equipment, and material necessary to complete the work described including excavating, hauling, and disposing of the undercut excavated material including the cost of obtaining disposal areas and placing and grading the excavated material on the disposal area.

1.03 REFERENCES

- A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
 - 1. ASTM Standard Specifications:
 - a. D698 - Laboratory Compaction Characteristics of Soil Using Standard Effort
 - b. D1556 - Density and Unit Weight of Soil In Place by the Sand-Cone Method.
 - c. D1557 - Laboratory Compaction Characteristics of Soil Using Modified Effort.
 - d. D2321 – Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.

- e. D6938 - In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods.
- 2. MDOT Current Standards:
 - a. Specifications for Construction.
 - b. Standard Plans.
- 3. St. Clair County Road Commission (SCCRC) Requirements.
- 4. The City of Port Huron Requirements.
- 5. St. Clair County Public Services Office Requirements.

1.04 DEFINITIONS

A. Terms:

- 1. Driving Surface: A pavement, curb, or sidewalk.
- 2. Excavation:
 - a. Removing the following materials from their present location:
 - 1) Native below-grade material such as soil, boulders less than 1/2 cubic yard in volume, and buried trees.
 - 2) Man-made items such as, but not necessarily limited to:
 - a) Bituminous and concrete paving.
 - b) Curbs.
 - c) Riprap.
 - d) Head walls.
 - e) Underground utilities.
 - f) Manholes and catch basins.
 - g) Foundations.
 - h) Sidewalks.
- 3. Fill: Soil, native material, imported material or other material which is placed over the subgrade, or excavated trench areas; under roadways, parking areas, walks, buildings, or structures; and anywhere else on the Site.
- 4. Grading: The act of moving soil from one location on the Site to another to achieve the contours and elevations as indicated on the Drawings and as herein specified.
- 5. Hardpan:
 - a. Cemented soil layers.
 - b. Is not hard clay layers that are not cemented.
- 6. Imported Material: Soil material which is purchased by CONTRACTOR and hauled onto the Site.
- 7. Native Material: Soil and other natural earth materials, except rock and boulders of 1/2 cubic yard or more in volume, which are existing on the Site prior to the start of Work.
- 8. Pavement: Any combination of subbase, base course and concrete, bituminous or aggregate surface course, including shoulders, placed on a subgrade. Includes roadways, parking areas, driveways, sidewalks, and bituminous seal coat.
- 9. Rock: igneous, metamorphic, or sedimentary rock; hardpan; or other solid material which does not soften when wet; or cannot be excavated without

- continuous drilling, sawing, blasting, or continuous use of a ripper or other special equipment. This includes all boulders of one-half (1/2) cubic yard or more in volume.
10. Structure: A building, retaining wall, tank, footing, slab, or other similar construction.
 11. Subbase: The layer of material placed on the subgrade as part of the pavement structure.
 12. Subgrade:
 - a. Below structures and below fill on the Site: The top elevation of the undisturbed native material after all topsoil is stripped off and excavation is completed.
 - b. Below driving surfaces: The bottom elevation of the subbase.
 13. Bedding: The material placed around a utility between 4 inches below to 12 inches above the utility the full width of the trench.
 14. Normal Trench Bottom: The surface of the undisturbed native material at an elevation 4 inches below the bottom of the utility.
 15. Special Foundations:
 - a. Specially constructed systems for support of underground utilities such as timber piling, concrete foundations and surcharge techniques.
 - b. Undercutting and placing imported or native materials are not special foundations.
 16. Suitable Material:
 - a. Native material excavated from the trench and approved as backfill by ENGINEER.
 - b. Not used under or within 1 on 1 slope of driving surfaces or structures.
 - c. Placed between the top of the bedding or trench backfill as indicated on the Drawings and the bottom of the surface restoration.
 17. Trench Backfill:
 - a. The material placed between the top of bedding and either the bottom of suitable material or the bottom of pavement/surface restoration, as indicated on the Drawings.
 - b. Used under and within 1 on 1 slope of driving surfaces or structures.
 18. Undercut: Excavation of native material from below the normal trench bottom.
 19. Utility Structure: Manhole, catch basin, pump station, valve chamber, junction chamber, water main valve, or other similar utility appurtenance.
 20. Other Definitions: Other earthwork terms not defined herein or in the Contract Documents shall be as defined in MDOT Standard Specifications for Construction.

1.05 DESIGN AND PERFORMANCE REQUIREMENTS

A. Trench Bottom Suitability:

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1. Be responsible for the suitability of the normal trench bottom in supporting the utility, bedding and backfill.
 2. Notify ENGINEER and await ENGINEER's decision if a possible unsuitable condition exists.
 3. Poor dewatering techniques or lack of excess water control shall not be a reason for additional payment for remedial measures.
- B. Trench Wall Stability:
1. Be responsible for the trench configuration, including sheeting, shoring and bracing necessary to support trench side walls from collapsing.
 2. Be responsible for the structural design and stability of a pipe-laying box if utilized on the Project to prevent trench walls from collapsing.

1.06 QUALITY ASSURANCE

- A. Testing will be performed in accordance with Section 01 40 00 "Quality Requirements."
- B. Compaction:
1. Predominately Granular Soils:
 - a. Determine density by the modified Proctor method, ASTM D1557.
 - b. Compact trench backfill and bedding to at least 95% maximum density.
 - c. Compact suitable material to at least 95% maximum density.
 - d. The first 12 inches of native material at the bottom of utility trenches:
 - 1) Test for density.
 - 2) Compact to at least 95% maximum density if the existing density is below 95%.
 2. Predominately Cohesive Soils:
 - a. Density shall be determined by using the standard Proctor method, ASTM D698.
 - b. Compact fill to at least 95% maximum density.
 - c. The first 12 inches of native material at the bottom of utility trenches:
 - 1) Test for density.
 - 2) Compact to at least 95% maximum density if the existing density is below 95%.

1.07 SUBMITTALS

- A. Action Submittals: For imported materials:
1. Source.
 2. MDOT classification.
 3. Sieve Analysis.

1.08 PROJECT CONDITIONS

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A. Dust Control:

1. Use all legal means necessary to control dust on and near the Work and on and near off-site borrow areas if such dust is caused by CONTRACTOR's operations during performance of the Work or if resulting from the condition of the Site when earthwork operations are suspended.
2. Moisten or otherwise treat haul roads, delivery roads, temporary site access roads and other surfaces as required to prevent dust from being a nuisance to the public, neighbors, and concurrent performance of other work on the Site.
3. Scrape, broom, or vacuum adjacent streets to remove tracked dirt every afternoon, or more as necessary if directed by ENGINEER. Utilize vacuum if dust from brooming is excessive in opinion of ENGINEER.

B. Existing Structures, Utility Structures, and Utilities:

1. Call MISS DIG to locate existing underground utilities prior to starting excavation.
2. Where utilities, utility structures or structures are encountered which are in active use:
 - a. Provide adequate protection.
 - b. Be responsible for repairing any damages to them.
3. Provide stand-by utility service if temporary removal is necessary for a period exceeding 2 hours.
4. Where utility service connections to occupied buildings must be temporarily disconnected, give 48 hours' notice to the affected occupants of the time and duration of the anticipated shutoff.
5. Notify Fire Department 48 hours in advance if water main or fire supply line shutoff is required.
6. Raise, lower, or move underground utilities, utility structures or structures which interfere with the utility or utility structure being constructed as part of this Work.

C. Special Backfilling Requirements:

1. Comply with the regulations of the MDOT, SCCRC, St. Clair County Public Services Office, and railroad company engineering departments with regard to filling, backfilling and compaction in their respective rights-of-way.
2. Obtain all necessary permits for filling off Site.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. General:
 - 1. Approval Required: Material shall be subject to the approval of ENGINEER.
 - 2. Notification: For approval of imported material, notify ENGINEER at least 1 week in advance of intention to import material, designate the proposed borrow area, and permit ENGINEER or his authorized representative to sample as necessary from the borrow area for the purpose of making acceptance tests to prove the quality of the material.
- B. Material Sources and Uses:
 - 1. Imported Material:
 - a. Fill in undercut.
 - b. Bedding.
 - c. Trench backfill.
 - 2. Native material unless quantity is not sufficient; then shall be imported material: Suitable material.
- C. Fill in Undercut: MDOT 902 Dense Graded Aggregate 21AA Limestone.
- D. Bedding:
 - 1. For Pipes :
 - a. MDOT 902 Granular Material Class II, or
 - b. MDOT 902 Dense Graded Aggregate 21AA Limestone.
 - 2. For Utility Structures:
 - a. MDOT 902 Dense Graded Aggregate 21AA Limestone.
- E. Trench Backfill: MDOT 902 Granular Material Class II below pavement cross section or up to one on one influence zone from edge of pavement followed by suitable excavated material to the surface.
- F. Suitable Material:
 - 1. Native Material Which is Used as Backfill:
 - a. Exclusive of gray or blue clay, peat, organic matter, or frozen lumps.
 - b. Containing no rocks or lumps over 3 inches in greatest dimension.
 - c. Having a moisture content such that material is capable of being compacted to 95% maximum density.
 - 2. MDOT 902 Granular Material Class II if native material is not adequate in opinion of ENGINEER.
- G. Concrete Encasement of Utilities:
 - 1. Only as indicated on the Drawings.

2.02 OTHER MATERIALS

- A. Other materials, not specifically described but required for proper completion of the work of this Section, shall be as selected by CONTRACTOR subject to the approval of ENGINEER.

PART 3 - EXECUTION

3.01 GENERAL

- A. Excavating, Backfilling and Compacting:
 - 1. For Structures: In accordance with Section 31 23 06 "Excavation and Fill for Structures."
 - 2. For Utility Structures: In accordance with this Section.
- B. Obstructions:
 - 1. Remove and dispose of buried trees, boulders less than 1/2 cubic yard in volume, driving surfaces, pipes and the like, as required for the performance of the Work.
 - 2. Exercise care in excavating around catch basins, inlets and manholes.
 - 3. Avoid removing or loosening castings or pushing dirt into utility structures.
 - 4. Repair or replace damaged or displaced castings; remove dirt entering utility structures during the performance of the Work at no additional cost to OWNER.
- C. Cutting Paved Surfaces and Similar Improvements:
 - 1. Cut pavement prior to excavating.
 - 2. All cuts shall be a minimum of 1-foot wider than trench on each side. When the remaining width of paved surface is less than 4 feet, remove the entire paved surface.
 - 3. Before removing pavement, mark the pavement removal area. The pavement removal shall always be perpendicular to the roadway.
 - 4. Concrete:
 - a. Pavements: Saw cut if over 3 feet from expansion or construction joint, otherwise remove to joint.
 - b. Sidewalks: Remove to joints.
 - c. Curb and Gutter: Remove to joints.
 - 5. Final Surface Course Bituminous: Saw cut joints unless otherwise approved by ENGINEER.
 - 6. Do not disturb or damage the adjacent pavement. If the adjacent pavement is disturbed or damaged, remove and replace the damaged pavement.
 - 7. CONTRACTOR may tunnel under curbs that are encountered. Replace curb disturbed by construction.
 - 8. Dispose of materials removed.
- D. Utilities to be Abandoned:
 - 1. When pipes, conduits, sewers or utility structures are removed from the trench leaving dead ends in the ground, fully plug such ends with brick and mortar.

2. Entirely remove and dispose of abandoned utility structures not identified to be salvaged, unless otherwise specified or indicated on the Drawings.
 3. Remove from the excavation all materials which can be readily salvaged and store at a location selected by the OWNER.
 4. All salvageable materials will remain the property of OWNER unless otherwise indicated by OWNER.
- E. Undercut:
1. If soft material, which in the opinion of ENGINEER is not suitable, is encountered below the normal trench bottom or below a utility structure ENGINEER may order the removal of this soft material and its replacement with specified material in order to make a suitable foundation for the construction of the utility or utility structure.
 2. All undercutting made at the order of ENGINEER will be paid for on the basis of the actual quantity of material excavated. Do not proceed further until instructions are received and necessary measurements made for purposes of establishing additional volume of excavation.
 3. No extra payment will be made if removal is required as a result of poor dewatering techniques.
 4. Undercutting which is specifically indicated on the Drawings or herein specified, shall be included in the base Bid.
 5. Place and compact specified fill in undercut.
 6. Special foundations shall be determined on an individual basis by ENGINEER in cooperation with CONTRACTOR, unless otherwise provided in the Contract Documents.

3.02 EXCAVATION AND TRENCHING

- A. General:
1. By open cut from surface unless designated otherwise.
 2. Slope sides of trench adequately for protection of the Work and safety of workers.
- B. Maximum Length of Open Trench: 100 feet.
- C. Width:
1. Minimum Clearance on Each Side of Utility: 6 inches.
 2. Maximum Width of Trench at Top of Bedding:
 - a. Up Through 15-Inch Diameter Utility: 30 inches.
 - b. Greater Than 15-Inch Diameter Utility: $\frac{4}{3}$ inside diameter of pipe plus 15 inches.
 3. Maximum Width of Trench at Ground Surface:
 - a. Not outside of the property line or easement.
 - b. As required for protection of the Work and safety of workers.
 - c. Use sheeting, bracing and shoring if required.
 4. Provide sufficient space in the trench to permit the joint to be properly made.

- D. Depth:
1. Excavate to provide the elevations, grades, and depths of cover indicated on the Drawings and herein specified.
 2. The 4 inches of required bedding material below the utility may be omitted if:
 - a. Approved by ENGINEER.
 - b. CONTRACTOR arranges and pays for testing of the native material.
 - c. The native material complies with MDOT 902 Granular Material Class II material or MDOT 902 Dense Graded Aggregate 21AA Limestone.
 - d. The material is compacted as specified herein.
 3. Excavate to the normal trench bottom elevation with an accuracy of ± 0.10 feet.
- E. Rock Removal:
1. Where rock is encountered within the excavation, expose the surface of the rock sufficient to permit adequate measurements to be taken before the rock excavation is started.
 2. Notify ENGINEER prior to removal if rock is encountered.
 3. No utility shall be within 6 inches of rock.
 4. Blasting will not be allowed.
 5. Rock removal shall be paid under separate Change Order unless a specific item appears in the Bid.
- F. Bedding:
1. Place the bedding material up to 1/8 the height of the utility. Compact as herein specified.
 2. Accurately shape the bedding material to fit the pipe shape. Recess the bedding to relieve the pressure on the bell or other projecting utility joint.
 3. After laying out the utility, tamp additional bedding in place up to the midpoint of the utility. Use hand-operated compactors to achieve the required compaction.
 4. Place additional bedding up to 12 inches above the top of the utility. Use hand operated compactors to achieve required compaction.
 5. Place bedding in maximum lifts of 6 inches.
 6. No payment shall be made for aggregate or stone bedding when used for CONTRACTOR convenience.
 7. Provide concrete encasement at utilities so indicated on the Drawings.
- G. Trench Backfill in accordance with The City of Port Huron Standard Detail Drawings:
1. Trench Detail A:
 - a. Suitable material placed between the top of the bedding and the bottom of the surface restoration.

- b. If trench is within 1 on 1 slope of driving surfaces or structures, place MDOT Class II sand from top of bedding to top of 1 on 1 slope influence zone, followed by suitable material to the bottom of the surface restoration.
 - 2. Trench Detail B:
 - a. MDOT Class II sand placed between the top of bedding and the bottom of pavement/surface restoration.
 - 3. Place backfill in 6-inch lifts and compact as herein specified. ENGINEER will consider greater lifts if testing indicates that the required compaction is being achieved.
- H. Utility Structures:
 - 1. Place and compact specified bedding below utility structures.
 - 2. Backfill around utility structures shall be in accordance with The City of Port Huron Standard Detail Drawings.
 - 3. Place backfill in 6-inch lifts and compact as herein specified.

3.03 DISPOSAL OF EXCESS EXCAVATED MATERIAL

- A. General: CONTRACTOR responsibility and expense.
- B. Disposal Sites:
 - 1. Material desired by OWNER shall be disposed of by CONTRACTOR in the following priority order:
 - a. At locations designated by the Contract Documents.
 - b. At locations on the Project Site by written arrangement with individual property owners.
 - c. OWNER may choose not to accept certain materials, including but not necessarily limited to, items from clearing, muck, peat, marl and whole or broken man-made items removed by construction.
 - 2. Material not desired by OWNER shall be disposed of in a location determined by CONTRACTOR.
 - 3. Disposal of materials shall not violate laws, rules, regulations and the like regarding the filling of flood plains, wetlands and other environmentally sensitive areas.
 - 4. Provide adequate controls to maintain disposal sites in a neat and safe condition by periodic leveling of material, and such other practices as are necessary.
 - 5. Provide soil erosion control measures necessary to prevent soil erosion and sedimentation of wetlands, rivers, ditches, or similar low lying areas.

3.04 EXCESS WATER CONTROL

- A. Regulations and Permits: Comply with soil erosion control permit in accordance with Mich. P.A. 451, Part 91 of 1994, the Natural Resource and Environmental Protection Act, and all pertinent rules, laws, and regulations.

- B. Unfavorable Weather:
 - 1. Do not place, spread or roll fill material during unfavorable weather conditions.
 - 2. Do not resume operations until moisture content and fill density are satisfactory to ENGINEER.
- C. Pumping and Drainage:
 - 1. Provide, maintain and use at all times during construction adequate means and devices to promptly remove and dispose of water from every source entering the excavations or other parts of the Work.
 - 2. Dewater by means which will ensure dry excavations, preserve final lines and grades, and do not disturb or displace adjacent soil. Use wells, portable pumps, temporary underdrains, or other methods as necessary.
 - 3. Perform Pumping and Drainage:
 - a. In such a manner to cause no damage to property or structures and without interference to the rights of the public, owners of private property, pedestrians, vehicular traffic, or the work of other CONTRACTORS.
 - b. In accordance with pertinent laws, rules, ordinances, and regulations.
 - 4. Do not overload or obstruct existing drainage facilities.
- D. General:
 - 1. Keep excavations dry during construction.
 - 2. Remove water by use of wells, well points, portable pumps, bailing, drains, underdrains or other acceptable methods.
 - 3. Provide crushed stone or gravel as required to aid dewatering operations.
 - 4. Divert or temporarily reroute existing sewers and drainage of discharge lines to adequate and acceptable outlets during construction. CONTRACTOR responsible to ascertain availability of outlets.
 - 5. Divert surface water from entering excavations by construction and maintenance of channels or berms.
 - 6. Sediment traps and other soil erosion control measures shall prevent soil particles from entering any sewer, watercourse or similar conveyance.
 - 7. Protect utilities, utility structures, and structures, existing and new, from hydrostatic uplift.

3.05 SHEETING, SHORING AND BRACING EXCAVATIONS

- A. General:
 - 1. Furnish, put in place and maintain sheeting, bracing and shoring as may be required to properly support the sides of excavations and to prevent movement of earth which could in any way injure the Work or adjacent property. Shoring and bracing must be designed by an engineer licensed in the State of Michigan.

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2. Exercise care in the removal of sheeting, shoring, bracing and timbering to prevent collapse or caving of the excavation faces being supported and damage to the Work and adjacent property.
 3. A pipe-laying box may be used in lieu of sheeting.
- B. Sheeting:
1. Do not install by jetting.
 2. Remove as backfilling proceeds, unless ordered left in place by ENGINEER. Use care to fill and compact voids created by removal, especially below mid-height of utility.
 3. Sheeting Left in Place:
 - a. Requires written approval of ENGINEER.
 - b. Cut off minimum of 2 feet below finished grade.

3.06 CLEANUP

- A. Upon completion of the work of this Section, remove all excess excavated material, trash, and debris resulting from construction operations. Remove equipment and tools. Leave the Site in a neat and orderly condition acceptable to ENGINEER, and in accordance with Section 01 70 00 "Execution and Closeout Requirements."

END OF SECTION 31 23 03

SECTION 31 23 06 – EXCAVATION AND FILL FOR STRUCTURES

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section covers excavation and backfill for the construction of buildings, retaining walls, footings, slabs, and other below ground structures. This Section includes the furnishing and installation of the major items listed below:
 - 1. Excavation in earth and rock.
 - 2. Disposal of items from clearing and unsuitable or excess excavated materials.
 - 3. Complete drainage of excavations.
 - 4. Temporary or permanent sheeting, bracing, and shoring of excavations.
 - 5. Installation of backfill materials.

1.02 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. The cost of all work under this item shall be included in the cost of the Project and no separate payment shall be made therefore unless listed in the Bid Form as a Bid Item.
- B. When listed in the Bid Form as a Bid Item:
 - 1. Undercut:
 - a. Basis of Measurement: By cubic yard (CY).
 - b. Basis of Payment: Furnishing all labor, equipment, and material necessary to complete the work described including excavating, hauling, and disposing of the undercut excavated material including the cost of obtaining disposal areas and placing and grading the excavated material on the disposal area.

1.03 REFERENCES

- A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
 - 1. ASTM Standards:
 - a. D698 - Laboratory Compaction Characteristics of Soil Using Standard Effort.
 - b. D1556 - Density and Unit Weight of Soil In Place by the Sand-Cone Method.
 - c. D1557 - Laboratory Compaction Characteristics of Soil Using Modified Effort.
 - d. D6938 - In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods.
 - 2. MDOT Current Standards:
 - a. Specifications for Construction.

- b. Standard Plans.
- 3. St. Clair County Road Commission (SCCRC) Requirements.
- 4. The City of Port Huron Requirements.
- 5. St. Clair County Public Services Office Requirements.

1.04 DEFINITIONS

A. Terms:

- 1. Driving Surface: A pavement, curb, or sidewalk.
- 2. Excavation:
 - a. Removing the following materials from their present location:
 - 1) Native below-grade material such as soil, boulders less than 1/2 cubic yard in volume, and buried trees.
 - 2) Man-made items such as, but not necessarily limited to:
 - a) Bituminous and concrete paving.
 - b) Curbs.
 - c) Riprap.
 - d) Head walls.
 - e) Underground utilities.
 - f) Manholes and catch basins.
 - g) Foundations.
 - h) Sidewalks.
- 3. Fill: Soil, native material, imported material or other material which is placed over the subgrade, or excavated areas; under roadways, parking areas, walks, buildings, or structures; and anywhere else on the Site
- 4. Grading: The act of moving soil from one location on the Site to another to achieve the contours and elevations as indicated on the Drawings and as herein specified.
- 5. Hardpan:
 - a. Cemented soil layers.
 - b. Is not hard clay layers that are not cemented.
- 6. Imported Material: Soil material which is purchased by CONTRACTOR and hauled onto the Site.
- 7. Native Material: Soil and other natural earth materials, except rock and boulders of 1/2 cubic yard or more in volume, which are existing on the Site prior to the start of Work.
- 8. Pavement: Any combination of subbase, base course and concrete, bituminous or aggregate surface course, including shoulders, placed on a subgrade. Includes roadways, parking areas, driveways, sidewalks, and bituminous seal coat.
- 9. Rock: igneous, metamorphic, or sedimentary rock; hardpan; or other solid material which does not soften when wet; or cannot be excavated without continuous drilling, sawing, blasting, or continuous use of a ripper or other special equipment. This includes all boulders of one-half (1/2) cubic yard or more in volume.
- 10. Structure: A building, retaining wall, tank, footing, slab, or other similar construction.

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11. Structure Backfill: Soil or other material which is placed against walls or sides of structures.
12. Subbase: The layer of material placed on the subgrade as part of the pavement structure.
13. Subgrade:
 - a. Below structures and below fill on the Site: The top elevation of the undisturbed native material after all top soil is stripped off and excavation is completed.
 - b. Below driving surfaces: The bottom elevation of the subbase.
14. Undercut: Excavation of native material from below the bottom of footings, floors, structures and subbases.
15. Utility Structures: Manhole, catch basin, pump station, valve chamber, junction chamber, water main valve, or other similar utility appurtenance.
16. Other Definitions: Other earthwork terms not defined herein or in the Contract Documents shall be as defined in MDOT Standard Specifications for Construction.

1.05 DESIGN AND PERFORMANCE REQUIREMENTS

- A. Excavation Side Stability: Be responsible for the structural design of all sheet piling, underpinning, shoring and bracing to prevent sides of excavation from collapsing and causing damage to adjacent structures, pavements, and materials.

1.06 QUALITY ASSURANCE

- A. Testing will be performed in accordance with Section 01 40 00 "Quality Requirements."
- B. Compaction:
 1. Predominately Granular Soils:
 - a. Density shall be determined by using the modified Proctor method, ASTM D1557.
 - b. Compact fill and backfill to at least 95% maximum density.
 - c. The first 12-inches of subgrade below all structures, fill and backfill on the Site:
 - 1) Shall be tested for density.
 - 2) Compact to at least 95% maximum density if the existing density is below 95%.
 2. Predominately Cohesive Soils:
 - a. Density shall be determined by using the standard Proctor method, ASTM D698.
 - b. Compact fill and backfill to at least 95% maximum density.
 - c. The first 12-inches of subgrade below all structures, fill, and backfill on the Site:
 - 1) Shall be tested for density.
 - 2) Compact to at least 95% maximum density if the existing density is below 95%.

1.07 SUBMITTALS

- A. Action Submittals: For imported materials:
 - 1. Source.
 - 2. MDOT classification.
 - 3. Sieve Analysis.

1.08 PROJECT CONDITIONS

- A. Dust Control:
 - 1. Use all legal means necessary to control dust on and near the Work and on and near all off-site borrow areas if such dust is caused by CONTRACTOR's operations during performance of the Work or if resulting from the condition of the Site when earthwork operations are suspended.
 - 2. Moisten or otherwise treat haul roads, delivery roads, temporary site access roads and other surfaces as required to prevent dust from being a nuisance to the public, neighbors, and concurrent performance of other work on the Site.
 - 3. Scrape, broom, or vacuum adjacent streets to remove tracked dirt every afternoon, or more often as necessary if directed by ENGINEER. Utilize vacuum if dust from brooming is excessive in opinion of ENGINEER.
- B. Existing Structures, Utility Structures, and Utilities:
 - 1. Call MISS DIG to locate all existing underground utilities prior to starting excavation.
 - 2. Where utilities, utility structures, or structures are encountered which are in active use:
 - a. Provide adequate protection.
 - b. Be responsible for repairing any damage to them.
 - 3. Provide stand-by utility service if temporary removal is necessary for a period exceeding 2 hours.
 - 4. Where utility service connections to occupied buildings must be temporarily disconnected, give 48 hours' notice to the affected occupants of the time and duration of the anticipated shutoff.
 - 5. Notify Fire Department 48 hours in advance if water main or fire supply line shutoff is required.
 - 6. Raise, lower, or move underground utilities, utility structures, or structures which interfere with the structure being constructed as part of this Work.
- C. Special Backfilling Requirements:
 - 1. Comply with the regulations of the MDOT, SCCRC, St. Clair County Public Services Office, and railroad company engineering departments with regard to filling, backfilling and compaction in their respective rights-of-way.
 - 2. Obtain all necessary permits for filling off Site.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. General:
 - 1. Approval Required: Material shall be subject to the approval of ENGINEER.
 - 2. Notification: For approval of imported material, notify ENGINEER at least 1 week in advance of intention to import material, designate the proposed borrow area, and permit ENGINEER or his authorized representative to sample as necessary from the borrow area for the purpose of making acceptance tests to prove the quality of the material.
- B. Material Sources and Uses:
 - 1. Imported Material:
 - a. Sand layers below floor slabs.
 - b. Fill in structure undercut.
 - c. Stone stabilization course below structures.
 - d. Structure backfill.
 - 2. Native material unless quantity is not sufficient; then shall be imported material:
 - a. Structure backfill not below driving surfaces.
 - 3. Native Material: Clay cap over structure backfill.
- C. Granular Layer Below Floor Slabs:
 - 1. Choose Either of the Following:
 - a. Sand-gravel fill of such gradation that 100% will pass a 1/2-inch sieve and not more than 10% by weight is lost by washing.
 - b. MDOT 902, Granular Material Class II.
- D. Fill In Structure Undercut: MDOT 902, Granular Material Class II or MDOT 902 Dense Graded Aggregate 21AA Limestone.
- E. Structure Backfill Below Driving Surfaces: MDOT 902, Granular Material Class II.
- F. Stone Stabilization Course:
 - 1. Crushed Stone: 1-1/2-inches maximum size.
 - 2. Filter Fabric:
 - a. By Mirafi; Amoco; Exxon; Nicolon; or equal.
 - b. Monofilament polypropylene woven fabric.
 - c. Equivalent opening size of 70.
- G. Structure Backfill Not Below Driving Surfaces:
 - 1. Native material.
 - 2. Exclusive of gray or blue clay, peat, organic matter, or frozen lumps.
 - 3. Containing no rocks or lumps over 3 inches in greatest dimension.
 - 4. Obtain approval for using native material as backfill from ENGINEER.

2.02 OTHER MATERIALS

- A. All other materials, not specifically described but required for proper completion of the work of this Section, shall be as selected by CONTRACTOR subject to the approval of ENGINEER.

PART 3 - EXECUTION

3.01 EXCAVATION

- A. Excavating, Backfilling, and Compacting:
 - 1. For Structures: In accordance with this Section.
 - 2. For Utility Structures: In accordance with Section 31 23 03 "Excavation and Fill for Utilities."
- B. Bracing and Sheeting:
 - 1. Do not install by jetting.
 - 2. Furnish, put in place, and maintain all sheeting, bracing, and shoring as may be required to properly support the sides of all excavations and to prevent all movement of earth which could in any way injure the Work or adjacent property.
 - 3. Exercise care in the removal of sheeting, shoring, bracing, and timbering to prevent collapse or caving of the excavation faces being supported and damage to the Work and adjacent property.
 - 4. Do not leave any sheeting or bracing in the excavation after completion of the Work, unless approved by ENGINEER.
- C. Obstructions:
 - 1. Remove and dispose of buried trees, boulders less than 1/2 cubic yard in volume, driving surfaces, pipes, and the like, as required for the performance of the Work.
 - 2. Exercise care in excavating around catch basins, inlets, and manholes.
 - 3. Avoid removing or loosening castings or pushing dirt into utility structures.
 - 4. Repair or replace damaged or displaced castings; remove dirt entering utility structures during the performance of the Work at no additional cost to OWNER.
- D. Utilities To Be Abandoned:
 - 1. When pipes, conduits, sewers, or other utilities or utility structures are removed from the excavation leaving dead ends in the ground, fully plug such ends with brick and mortar.
 - 2. Entirely remove and dispose of abandoned utility structures not identified to be salvaged, unless otherwise specified or indicated on the Drawings.
 - 3. Remove from the excavation all materials which can be readily salvaged and store at a location designated by OWNER.
 - 4. All salvageable materials will remain the property of OWNER unless otherwise indicated by OWNER.

E. Cutting Paved Surfaces and Similar Improvements:

1. All cuts shall be a minimum of 1-foot wider than excavation on each side. When the remaining width of paved surface is less than 4 feet, remove the entire paved surface.
2. Before removing pavement, mark the pavement removal area. The pavement removal shall always be perpendicular and/or parallel to the existing pavement joints.
3. Concrete:
 - a. Pavements: Saw cut if over 3 feet from expansion or construction joint, otherwise remove to joint.
 - b. Sidewalks: Remove to joints.
 - c. Curb and Gutter: Remove to joints.
4. Final Surface Course Bituminous: Saw cut joints unless otherwise approved by ENGINEER.
5. Do not disturb or damage the adjacent pavement. If the adjacent pavement is disturbed or damaged, remove and replace the damaged pavement.
6. CONTRACTOR may tunnel under curbs that are encountered. Replace curb disturbed by construction.
7. Dispose of materials removed.

F. Undercut:

1. If suitable bearing for foundations is not encountered at the elevations indicated on the Drawings immediately notify ENGINEER.
2. If soft material, which in the opinion of ENGINEER is not suitable, is encountered below a structure, ENGINEER may order the removal of this soft material and its replacement with specified material in order to make a suitable foundation for the construction of the structure.
3. All undercutting made at the order of ENGINEER will be paid for on the basis of the actual quantity of material excavated. Do not proceed further until instructions are received and necessary measurements made for purposes of establishing additional volume of excavation.
4. No extra payment will be made if removal is required as a result of poor dewatering techniques.
5. Undercutting which is specifically indicated on the Drawings or herein specified, shall be included in the base Bid.
6. Soil removed may be used as fill in areas not below driving surfaces, structures, or utility structures.
7. Compact subgrade at bottom of undercut prior to placing fill.
8. Place and compact specified fill in undercut.
9. Lateral extent of undercut shall be a horizontal distance equal to the depth of undercut below structure.

G. Excavating:

1. All excavation shall be by open cut from the surface except as herein specified or as indicated on the Drawings.

2. All excavations for structures shall be made in such manner and to such depth and width as will give ample room for building the structures and for bracing, sheeting, and supporting the sides of the excavation, for pumping and draining groundwater and wastewater which may be encountered, and for the removal of all materials excavated.
3. Excavate to the required cross section and elevation indicated in the Drawings. Subgrade shall not vary more than 0.1 feet above or below the established elevations.
4. All depressions caused by excess excavation, traffic or rolling shall be filled with MDOT 902 Granular Material Class II or approved fill and rerolled and compacted in place as specified herein.
5. If required because of excess water conditions, place stone stabilization course prior to proceeding with construction. Place filter fabric over stone stabilization course.

H. Rock Removal:

1. Where rock is encountered within the excavation, expose the surface of the rock sufficient to permit adequate measurements to be taken before the rock excavation is started.
2. Notify ENGINEER prior to removal if rock is encountered.
3. Blasting will not be allowed.
4. Rock removal shall be paid under separate Change Order unless a specific item appears in the Bid.

I. Frost Protection: Protect bottoms of excavations from frost.

3.02 SHEETING, SHORING AND BRACING EXCAVATIONS

A. General:

1. Furnish, put in place and maintain sheeting, bracing and shoring as may be required to properly support the sides of excavations and to prevent movement of earth which could in any way injure the Work or adjacent property.
2. Exercise care in the removal of sheeting, shoring, bracing and timbering to prevent collapse or caving of the excavation faces being supported and damage to the Work and adjacent property.

B. Sheeting:

1. Do not install by jetting.
2. Do not leave any sheeting or bracing in the excavation after completion of the Work, unless approved by the ENGINEER.
3. Sheeting Left in Place:
 - a. Requires written approval of ENGINEER.
 - b. Cut off minimum of 2 feet below finished grade.

3.03 FILL

A. General:

1. Do not place fill until the subgrade has been examined by ENGINEER.
2. Place fill in even layers not exceeding 6 inches in depth and thoroughly compact as herein specified.
3. Do not place additional fill until compaction on a lift complies with specification requirements.
4. If an analysis of the soil being placed shows a marked difference from 1 location to another, the fill being placed shall not be made up of a mixture of these materials.
5. Handle each different type of material continuously so that field control of moisture and density may be based upon a known type of material.
6. Do not place fill following a heavy rain without first making certain on isolated test areas that compaction can be obtained without damage to the already compacted fill.
7. Do not place fill on frozen subgrade.

B. Compaction:

1. Select compaction equipment to achieve the required compaction without damaging adjacent structures.
2. Suggested Equipment Selections:
 - a. If soil is predominantly granular, use pneumatic tired or vibratory drum rollers loaded to not less than 325 pounds per rated inch of tire width.
 - b. For clay fills, compact each layer with sheepsfoot rollers. Rollers shall have staggered rows of feet projecting not less than 7 inches from drum and shall be loaded to produce at least 200 pounds per square inch of tamping area in contact with the ground.
 - c. Compact around structures with hand-operated vibrating compactors for granular soils and Barco rammer type compactors for clay soils.

C. Moisture:

1. Compact all fill with the moisture content as specified.
2. If fill material is too wet, provide and operate approved means to assist the drying of the fill until suitable for compaction.
3. If fill material is too dry, provide and operate approved means to add moisture to the fill layers.

3.04 STRUCTURE BACKFILL

A. General:

1. Remove debris from excavations before backfilling.
2. Do not backfill against foundation walls until:

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- a. Approved by ENGINEER.
- b. All indicated perimeter insulation is in place.
- 3. Protect insulation during filling operations.
- 4. Wherever possible, backfilling shall be simultaneous on both sides of walls to equalize lateral pressures.
- 5. Do not backfill on only 1 side of vertically spanning walls unless walls are adequately shored or permanent construction is in place to furnish lateral support on both top and bottom of wall.
- 6. Place all backfill in layers not exceeding 6 inches in depth.
- 7. Do not place backfill on frozen subgrade.
- 8. Place an 18-inch layer of clay over granular backfill to prevent surface water from saturating the granular backfill. Place 4-inches of topsoil over the clay cap.

3.05 EXCESS WATER CONTROL

- A. Regulations and Permits: Comply with soil erosion control permit in accordance with Mich. P.A. 451, Part 91 of 1994, the Natural Resource and Environmental Protection Act, and all pertinent rules, laws, and regulations.
- B. Unfavorable Weather:
 - 1. Do not place, spread, or roll any fill material during unfavorable weather conditions.
 - 2. Do not resume operations until moisture content and fill density are satisfactory to ENGINEER.
- C. Pumping and Drainage:
 - 1. Provide, maintain, and use at all times during construction adequate means and devices to promptly remove and dispose of all water from every source entering the excavations or other parts of the Work.
 - 2. Dewater by means which will ensure dry excavations, preserve final lines and grades, and do not disturb or displace adjacent soil. Use wells, portable pumps, temporary underdrains or other methods as is necessary.
 - 3. Perform Pumping and Drainage:
 - a. In such a manner to cause no damage to property or structures and without interference with the rights of the public, owners of private property, pedestrians, vehicular traffic, or the work of other CONTRACTORS.
 - b. In accordance with all pertinent laws, rules, ordinances and regulations.
 - 4. Do not overload or obstruct existing drainage facilities.
 - 5. Provide berms or channels to prevent flooding of subgrade. Promptly remove all water collected in depressions.

3.06 DISPOSAL OF EXCESS EXCAVATED MATERIAL

- A. General:
 - 1. Remove and properly dispose of all excavated material not needed to complete filling and backfilling.
 - 2. Dispose of excess excavated material at a location off the Site.
 - 3. Disposal of all materials shall not violate laws, rules, regulations and the like regarding the filling of flood plains, wetlands and other environmentally sensitive areas.
 - 4. Provide adequate controls to maintain disposal sites in a neat and safe condition by periodic leveling of material and such other practices as are necessary.
 - 5. Provide all soil erosion control measures necessary to prevent soil erosion and sedimentation of wetlands, rivers, ditches, or similar low lying areas.

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3.07 CLEANUP

- A. Upon completion of the work of this Section, remove all excess excavated material, trash, and debris resulting from construction operations. Remove equipment and tools. Leave the Site in a neat and orderly condition acceptable to ENGINEER, and in conformance with Section 01 70 00 "Execution and Closeout Requirements."

END OF SECTION 31 23 06

SECTION 31 25 00 – EROSION & SEDIMENTATION CONTROL

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes the furnishing, installation and maintenance of soil erosion and sedimentation control measures.

1.02 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. The cost of all work under this item shall be included in the cost of the Project and no separate payment shall be made therefore unless listed in the Bid Form as a Bid Item.
- B. When listed in the Bid Form as a Bid Item:
 - 1. Erosion Control, Gravel Access Approach:
 - a. Basis of Measurement: Each (Ea).
 - b. Basis of Payment: Furnishing all labor, equipment, and material necessary to complete the work described, per the detail on the plans and per St. Clair County Public Services Office.
 - 2. Erosion Control, Sediment Filter Fence:
 - a. Basis of Measurement: Each (Ea).
 - b. Basis of Payment: Furnishing all labor, equipment, and material necessary to complete the work described, per the detail on the plans and per St. Clair County Public Services Office.
 - 3. Erosion Control, Inlet Protection, Fabric Drop:
 - a. Basis of Measurement: Each (Ea).
 - b. Basis of Payment: Furnishing all labor, equipment, and material necessary to complete the work described, per the detail on the plans and per St. Clair County Public Services Office.
 - 4. Erosion Control, Silt Fence:
 - a. Basis of Measurement: Feet (Ft).
 - b. Basis of Payment: Furnishing all labor, equipment, and material necessary to complete the work described, per the detail on the plans and per St. Clair County Public Services Office.
 - 5. Mulch Blanket:
 - a. Basis of Measurement: Square yard (Sy).
 - b. Basis of Payment: Furnishing all labor, equipment, and material necessary to complete the work described, per the detail on the plans and per St. Clair County Public Services Office.
 - 6. Riprap, Plain:

- a. Basis of Measurement: Square yard (Sy).
- b. Basis of Payment: Furnishing all labor, equipment, and material necessary to complete the work described, per the detail on the plans and per St. Clair County Public Services Office.

1.03 REFERENCES

- A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
 - 1. Soil erosion and sedimentation control rules and guidelines of the St. Clair County Public Services Office and the Michigan Department of Environment, Great Lakes and Energy (EGLE).

1.04 SUBMITTALS

- A. Product Data:
 - 1. Mulch blankets.
 - 2. Geotextile fabric.
 - 3. Seed mixtures.
 - 4. Fertilizer.
 - 5. Turbidity curtain.
 - 6. Silt Guard.
 - 7. Dewatering Filter Bag.
 - 8. Enviroberm.

1.05 QUALITY ASSURANCE

- A. The CONTRACTOR shall follow the procedures delineated below and construct and maintain the facilities shown on the Drawings to minimize soil erosion and off site sedimentation during construction of this Project
- B. Stop Work Order:
 - 1. OWNER reserves the right to issue a Stop Work Order if soil erosion and sedimentation controls are not properly installed or maintained.
 - 2. Work performed under a Stop Work Order will not be considered for payment.
 - 3. Costs resulting from delay due to issuance of a Stop Work Order shall be the responsibility of CONTRACTOR.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in original, unbroken, brand marked containers or wrapping as applicable.
- B. Handle and store materials in a manner which will prevent deterioration, damage, contamination with foreign matter, damage by weather or elements, and in accordance with Manufacturer's directions.

- C. Reject damaged, deteriorated or contaminated material and immediately remove from the Site. Replace rejected materials with new materials at no additional cost to OWNER.

PART 2 - PRODUCT

2.01 SOIL EROSION AND SEDIMENTATION CONTROL MATERIALS

- A. Vegetation:
 - 1. Temporary Vegetative Cover: Perennial ryegrass or Alfalfa. Provide mix design for hydroseed mixes.
 - 2. Permanent Vegetative Cover: Sod or Seed, fertilizer, and mulch blanket all disturbed areas.
- B. Mulch Blanket:
 - 1. Biodegradable:
 - a. Straw: Tensar North American Green HydraMax; or equal.
 - b. Coconut: Tensar North American Green RollMax C-125; or equal.
 - c. Straw and Coconut: Tensar North American Green RollMax SC-150; or equal.
 - 2. Non-Degradable: Polyester: Tensar North American Green EroNet P-300; or equal.
 - 3. Anchoring Staples or Pins:
 - a. Hardwood stakes at least 6 inches long;
- C. Riprap: In accordance with Section 31 37 00 "Riprap."
- D. Geotextile Fabric: Non-woven.
- E. Silt Guard:
 - 1. Above Ground Filters:
 - a. The Silt Saver by Silt Saver, Inc.; or equal approved by OWNER and agency having jurisdiction.
 - b. Nonwoven polypropylene filter with needle punched holes.
 - c. High density polyethylene frame.
 - 2. Below Ground Filters:
 - a. Siltsak by ACF Environmental; or equal.
 - b. Geotextile fabric silt sump.
 - c. 200 gallons per minute per square foot (GPM/SF) permeability.
 - d. Manufactured to meet size of inlet.
- F. Dewatering Filter Bags: Made From Geotextile Fabric:
 - 1. Manufacturer:
 - a. Ultratech International, Inc.: Ultra Dewatering Bag.
 - b. Pactec: Geopac.
 - c. Or equal.
- G. Geotextile Silt Fence:

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1. Manufacturer:
 - a. Synthetic Industries, Terra Tex SC.
 - b. Exxon, GTF-180.
 - c. Enviroberm.
 - d. Or equal.
- H. Turbidity Curtain:
 1. Impermeable barrier designed to control the setting of solids (silts).
 2. Constructed of flexible reinforced thermoplastic material, 18oz/yd² minimum, yellow color.
 3. Dielectrically welded or double-sewn seams upper hem of sufficient strength to contain flotation material.
 4. Flotation material to be expanded polystyrene of sufficient diameter to support curtain at or above the water level.
 5. Dielectrically welded or double-sewn seams lower hem of sufficient strength to enclose lower ballast.
 6. Lower ballast to be galvanized steel chain of sufficient strength and weight to hold curtain in vertical position.
 7. Curtain to be tied to concrete anchors at both ends, top and bottom, to prevent moving.

PART 3 - EXECUTION

3.01 GENERAL

- A. Standards:
 1. Achieve Effective Erosion Control:
 - a. Provide all materials per approved SESC plan.
 - b. Promptly take actions necessary to prevent off Site sedimentation.
 2. Maintain erosion controls.
 3. Remove temporary soil erosion and sedimentation control measures once permanent measures are established and accepted by the ENGINEER.
- B. Site Evaluation:
 1. Conduct a field evaluation of the Site:
 - a. Prior to start of the Work.
 - b. With representatives of OWNER / ENGINEER.
- C. All disturbed surface areas (including utility trenches) shall be temporarily graded and/or ditched to direct all water runoff from such areas to sedimentation control devices so as to prevent sedimentation from entering a watercourse, sewer, or adjacent lands.
- D. After the Project Work has been completed, inspected, stabilized, and approved, the CONTRACTOR shall remove all sedimentation control devices, material, and their collected silt and debris and complete the Project Work in accordance with the Drawings.
- E. In roadway and driveway areas temporary aggregate surfacing shall be placed immediately after the backfilling operation has been completed.

- F. Dust control measures shall be taken at all times.

3.02 TEMPORARY VEGETATIVE COVER

A. General:

- 1. Permanent soil erosion control measures for all slopes, channels, ditches, or any disturbed land area shall be completed within 5 calendar days after final grading or the final earth change has been completed. When it is not possible to permanently stabilize a disturbed area after earth change activities ceases, temporary soil erosion control measures shall be implemented immediately. All temporary soil erosion control measures shall be maintained until permanent soil erosion control measures are implemented. All permanent soil erosion control measures will be implemented and established before a certificate of compliance is issued.
- B. Seed: Apply uniformly at the application rate specified by the MDOT Standard Specifications for Construction Table 917-1 Seed Mixtures.
- C. Mulch: As needed to effectively control soil erosion.

3.03 MULCH BLANKET

- A. Direction of installation, staple patterns and other requirements in accordance with Manufacturer's directions and the Office of the St. Clair County Public Services Commissioner Standards.
- B. Location: Where indicated on the Drawings or as directed by the ENGINEER or Office of St. Clair County Public Services Commissioner SESC department.

3.04 GEOTEXTILE SILT FENCE

- A. Install silt fence in accordance with Manufacturer's instructions.
- B. Location: Where indicated on the Drawings or as directed by the ENGINEER.

3.05 OPEN CHANNEL EXCAVATION

- A. Power equipment such as bulldozers shall not enter the water unless approved by ENGINEER.
- B. Complete excavation, clearing, grubbing, snagging, tree cutting, pulling, raking, and related work in such a way as to minimize erosion of soil in the areas in which work is completed.
- C. Construct sediment basins prior to excavation.
- D. Comply with measures for soil erosion and sediment control as indicated on the Drawings.

3.06 AIRBORNE SEDIMENT

A. Dust Control:

- 1. Use legal means necessary to control dust on and near the Work and on and near off Site borrow areas if such dust is caused by CONTRACTOR's operations during performance of the Work or if resulting from the condition of the Site when earthwork operations are suspended.
- 2. Treat haul roads, delivery roads, temporary Site access roads and other surfaces as required to prevent dust from being a nuisance to the public, neighbors, and concurrent performance of other work on the Site, and as directed by ENGINEER.
- 3. Scrape and broom adjacent streets and paved areas daily to remove tracked dirt.

B. Wind Erosion:

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1. Erect and maintain barriers to prevent migration of windblown sediment off Site.
2. Conduct operations in such a manner as to minimize the amount of Site area exposed to wind erosion.
3. Be responsible for removal of windblown sediments deposited off Site, including costs for repairs required due to sediment deposition and removal.
4. Erect and maintain snow fence windward side of earthwork.

END OF SECTION 31 25 00

SECTION 32 11 23 – AGGREGATE BASE COURSES

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes furnishing and installation of the major items listed below:
 - 1. Aggregate Surface Course.
 - 2. Base course.
 - 3. Subbase.
 - 4. Temporary Maintenance Aggregate.

1.02 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. The cost of all work under this item shall be included in the cost of the Project and no separate payment shall be made therefore unless listed in the Bid Form as a Bid Item.
- B. When listed in the Bid Form as a Bid Item:
 - 1. Aggregate Surface Course (of the thickness specified):
 - a. Basis of Measurement: Square yard (SY) for the actual number of square yards of road or drive constructed.
 - b. Basis of Payment: Furnishing all labor, equipment, and materials required to perform the work including, but not limited to, grading the existing surface, furnishing, placing, grading, and compacting the aggregate material to the proper profile; applying calcium chloride when required; and maintaining the surface until final acceptance.
 - 2. Aggregate Base (of the thickness specified):
 - a. Basis of Measurement: Square yard (SY) for the actual number of square yards of aggregate base constructed.
 - b. Basis of Payment: Furnishing all labor, equipment, and materials required to prepare the subbase, proof roll subgrade, supply and place the base material specified, rolling, compacting, grading, and maintaining the road until its acceptance. This item will include the cost of aggregate shoulders when required.
 - 3. Subbase:
 - a. Basis of Measurement: Cubic yard (CY) for the actual number of cubic yards of subbase constructed.
 - b. Basis of Payment: Furnishing all labor, equipment, and materials required to prepare the subgrade, proof roll subgrade, supply and place the subbase material specified, rolling, compacting, and grading to achieve the proper profile.
 - 4. Shoulder Aggregate Surface Course (of the thickness specified):

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- a. Basis of Measurement: Square yard (SY) for the actual number of square yards of road or drive constructed.
 - b. Basis of Payment: Furnishing all labor, equipment, and materials required to perform the work including, but not limited to, grading the existing surface, furnishing, placing, grading, and compacting the aggregate material to the proper profile; applying calcium chloride when required; and maintaining the surface until final acceptance.
5. Temporary Maintenance Aggregate:
- a. Basis of Measurement: Square yard (SY) for the actual number of square yards of maintenance aggregate placed.
 - b. Basis of Payment: Furnishing all labor, equipment, and materials necessary to supply, place, grade, and compact temporary maintenance aggregate. This item includes the cost of removing temporary maintenance aggregate, when no longer needed, to the depths and profiles required to restore to the designed section specified on the Drawings. This item also includes disposal of temporary maintenance aggregate material off site, if required.

1.03 REFERENCES

- A. Except as herein specified or as indicated on the Drawings, the Work of this Section shall comply with the following:
 - 1. ASTM Standard Test Methods:
 - a. D1556 - Density and Unit Weight of Soil In Place by the Sand-Cone Method.
 - b. D1557 - Laboratory Compaction Characteristics of Soil Using Modified Effort.
 - c. D2922 - Density of Soil and Soil-Aggregate In Place by Nuclear Methods.
 - 2. MDOT Current Standards:
 - a. Specifications for Construction.
 - b. Standard Plans.
 - 3. St. Clair County Road Commission (SCCRC) Requirements.
 - 4. The City of Port Huron Requirements.
 - 5. St. Clair County Department of Public Services Requirements.

1.04 DEFINITIONS

- A. Terms:
 - 1. Base Course: The layer of specified material of designed thickness placed on a subbase or a subgrade to support a surface course.
 - 2. Pavement Structure: Combination of subbase, base course, and surface course, including shoulders, placed on a subgrade.
 - 3. Plan Grade: Vertical control grade indicated on the Drawings.

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4. Roadbed: The portion of the roadway between the outside edges of finished shoulders, or the outside edges of berms back of curbs or gutters, when constructed.
5. Roadside: The portion of the right-of-way outside of the roadway.
6. Roadway: The portion of the right-of-way required for construction, limited by the outside edges of slopes and including ditches, channels, and all structures pertaining to the Work.
7. Shoulder: The portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use, and for lateral support of base and surface courses.
8. Subbase: The layer of specified material of designed thickness placed on the subgrade as a part of the pavement structure.
9. Subgrade: The portion of the earth grade upon which the pavement is to be placed.
10. Surface Course: The layer of specified material of designed thickness placed above a base course as a final aggregate topping course.
11. Temporary Maintenance Aggregate: The layer of specified material placed temporarily to backfill an excavated area to match surrounding grade and allow the work area to be opened to traffic.

1.05 SUBMITTALS

- A. Action Submittals: For aggregate:
 1. Source.
 2. MDOT classification.
 3. Sieve analysis.

1.06 QUALITY ASSURANCE

- A. Testing of Aggregate Materials: In accordance with Section 01 40 00 "Quality Requirements."
- B. Compaction:
 1. Shall be in accordance with SCCRC and MDOT requirements.
 2. Determine density by the modified Proctor method, ASTM D1557.
 3. Compact subbase to at least 95% maximum density at a moisture content not greater than optimum.
 4. Compact aggregate base to at least 95% maximum density at a moisture content not greater than optimum for aggregate base under hot mix asphalt pavement.
 5. Compact aggregate base to at least 95% maximum density at a moisture content not greater than optimum for aggregate base under concrete pavement.
 6. Compact shoulders to at least 95% maximum density at a moisture content not greater than optimum.

1.07 PROJECT CONDITIONS

- A. Dust Control:
 - 1. On a daily basis, use all legal means necessary to control dust on and near the Work and on and near off-site borrow areas if such dust is caused by CONTRACTOR's operations during performance of the Work or if resulting from the condition of the Site when earthwork operations are suspended.
 - 2. Moisten or otherwise treat haul roads, delivery roads, temporary Site access roads and other surfaces as required to prevent dust from being a nuisance to the public, neighbors, and concurrent performance of other work on the Site.
- B. Existing Utility Structures:
 - 1. Where utility structures are encountered which are in active use:
 - a. Provide adequate protection.
 - b. Be responsible for their damage.
 - 2. Adjust utility structures to meet plan grade.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. General:
 - 1. Approval Required: Material shall be subject to the approval of ENGINEER.
 - 2. Notification: For approval of materials, notify ENGINEER at least 1 week in advance of intention to import material, designate the proposed stockpile area, and permit ENGINEER or his authorized representative to sample as necessary from the stockpile area for the purpose of making acceptance tests to prove the quality of the material.
- B. Subgrade: In accordance with Section 31 22 00 "Grading."
- C. Material Source: Imported Material:
 - 1. Subbase.
 - 2. Base course.
 - 3. Surface course.
- D. Subbase:
 - 1. MDOT 902, Granular Material Class II.
 - 2. Thickness compacted in place: as indicated on the Drawings.
- E. Aggregate Base Course:
 - 1. MDOT 902, Dense Graded Aggregate 21AA Limestone.
 - 2. Thickness Compacted in Place: as indicated on the Drawings.
- F. Aggregate Shoulders and Surface Course:
 - 1. MDOT 902, Dense Graded Aggregate 23A Limestone.

- G. Temporary Maintenance Aggregate:
 - 1. MDOT 902, Dense Graded Aggregate 21AA Limestone.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Subgrade:
 - 1. Prepared in accordance with Section 31 22 00 "Grading."
 - 2. Maintain in a smooth and compacted condition until the subbase or base course has been placed.
 - 3. Proof roll subgrade prior to placing subbase or base course.
 - 4. No base course shall be placed on the subgrade until it has been approved by ENGINEER.

3.02 INSTALLATION

- A. Subbase:
 - 1. Smooth, spread and compact.
 - 2. Place in one layer, provided that the depth of the compacted layer does not exceed 12 inches.
 - 3. Where the specified depth of subbase is more than 12 inches, place material in layers of approximately equal thickness.
 - 4. Construct to the grade and cross section as indicated on the Drawings.
 - 5. Should the subgrade at any time prior to or during the placing of subbase become soft or unstable to the extent that rutting occurs in the subgrade or to the extent that subgrade material is forced up into the subbase materials, the operation of hauling and placing subbase shall be immediately discontinued. Where subgrade material has become mixed with the subbase material, the mixed material shall be removed and disposed of. After the subgrade has been corrected to the specified condition, new subbase material shall be placed and compacted as specified above.
 - 6. Shape to specified crown and grade within a tolerance of plus 1-inch and maintain in smooth condition.
 - 7. Do not place on a frozen, soft, unstable or rutted subgrade.
 - 8. Remove, dispose of and replace subbase material, at CONTRACTOR's expense, if it becomes mixed with subgrade material.
 - 9. Proof roll subbase prior to installation of base course.
- B. Base and Surface Course:
 - 1. Do not place aggregate base on frozen, soft, unstable or rutted subgrade, subbase, or aggregate base.
 - 2. Additives may be used to ease compaction, shaping, and maintenance of the aggregate surface.
 - 3. Do not rut or distort the subbase material or aggregate base during spreading.

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4. Place in uniform layers to such a depth that when compacted, the course will have the thickness indicated on the Drawings.
5. The compacted depth of each layer shall not be more than 6 inches nor less than 3 inches.
6. Compact each layer of aggregate.
7. Place aggregate shoulder material in conjunction with the top layer of aggregate base material.
8. Shape to the crown and grade within a tolerance of ± 0.05 feet unless otherwise specified. The surface of each spreading operation shall be continuously maintained in a smooth condition.
9. Roll the shaped surface, when required, to provide thorough compaction.
10. Where the existing surface is very irregular, the use of a scarifier may be required. Wetting may be required to facilitate shaping the surface and to assist in providing compaction.
11. Remove, dispose of and replace aggregate base material, at the CONTRACTOR's expense, if it becomes mixed with the subbase or subgrade material.
12. Final shaping and compacting shall be accomplished by use of a subgrade machine operating on crawler tracks, or by the use of a maintainer or surface planer, with a rigid frame.
13. If the subgrade, subbase, or aggregate base is damaged due to the CONTRACTOR's operations or by traffic, restore to the specified condition at
14. CONTRACTOR's expense.

END OF SECTION 32 11 23

SECTION 32 13 13 – CONCRETE PAVING

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes the furnishing and installation of form work, reinforcement, concrete pavement, and pavement markings for exterior work:
 - 1. Roadways.
 - 2. Parking lots.
 - 3. Miscellaneous exterior concrete pavement (not including concrete walks, driveways, and curb and gutter).

1.02 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Concrete Pavement (of the thickness specified):
 - 1. Basis of Measurement: Square yard (SY) for the actual number of square yards of concrete pavement constructed.
 - 2. Basis of Payment: Furnishing all labor, equipment, and materials necessary to construct the concrete pavement as specified. This work shall include preparation of the subgrade; furnishing, placing, and compacting subbase and base materials; furnishing, placing, curing, and protecting the concrete pavement and integral curbs, including tie bars, joint hook bolts, end headers, pavement reinforcement (when specified), all joint materials, load transfer devices, dowel bar assemblies, end of pour load transfer devices, sawing, cleaning, patching spalls, tests, backfill, fine grading, cleanup, pavement admixtures and accelerators, cold weather protection; and includes all labor, material, equipment, and machinery required to construct the pavement complete in place. This Bid Item includes the cost of curb drops, adjustment of structures within the ROW, protecting and replacing government plat and street corners, designated survey bolts and benchmarks, pavement striping, and marking if specified. Also included is the cost of replacing existing aggregate, bituminous, or concrete drive approaches, if necessary, due to change in grade of the ROW grading cross-sections or due to damage by the CONTRACTOR's construction methods and operations. No extra payment will be made for extra thickness of concrete at joints and in intersections.
- B. Concrete Pavement Patching (of the thickness specified):
 - 1. Basis of Measurement: Square yards (SY) for the actual number of square yards of concrete pavement replaced.
 - 2. Basis of Payment: Furnishing, placing, and compacting aggregate base material; furnishing, placing, finishing, and curing all concrete pavement required, including saw cutting, subgrade or base preparation, backfill, grading, furnishing and placing shoulder material, reinforcement, dowel bars, lane ties, joint materials, and other Work required to complete this item.

- C. Pavement Marking (of the size and color specified):
 - 1. Basis of Measurement: Linear Feet (LF).
 - 2. Basis of Payment: Furnishing all labor, equipment, and material necessary to perform the work of this item.
- D. Cold Plastic Pavement Marking (of the size and color specified):
 - 1. Basis of Measurement: Linear Feet (LF).
 - 2. Basis of Payment: Furnishing all labor, equipment, and material necessary to perform the work of this item including removing curing compound from new concrete surfaces before applying cold plastic tape.
- E. Cold Plastic Pavement Marking (of the symbol specified):
 - 1. Basis of Measurement: Each.
 - 2. Basis of Payment: Furnishing all labor, equipment, and material necessary to perform the work of this item including removing curing compound from new concrete surfaces before applying cold plastic tape.

1.03 REFERENCES

- A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
 - 1. ASTM Publications:
 - a. A185 - Steel Welded Wire, Fabric, Plain for Concrete Reinforcement.
 - b. A615 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
 - c. A775 - Standard Specification for Epoxy-Coated Steel Reinforcing Bars.
 - d. A820 - Steel Fibers for Fiber Reinforced Concrete.
 - e. C33 - Specification for Concrete Aggregates.
 - f. C39 - Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 - g. C94 - Specification for Ready-Mixed Concrete.
 - h. C136 - Sieve Analysis of Fine and Coarse Aggregates.
 - i. C150 - Specification for Portland Cement.
 - j. C260 - Specification for Air-Entraining Admixtures for Concrete.
 - k. C309 - Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 - l. C330 - Specification for Lightweight Aggregates for Structural Concrete.
 - m. C494 - Specification for Chemical Admixtures for Concrete.
 - n. C618 - Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.
 - o. C989 - Ground Granulated Blast Furnace Slag (GGBFS) For Use in Concrete and Mortars.
 - p. C1116 Standard Specification for Fiber Reinforced Concrete and Shotcrete.

- q. C1260 - Potential Alkali Reactivity of Aggregates (Mortar-bar method).
- r. C1293 - Determination of Length Change of Concrete Due to Alkali-silica Reaction (Concrete prism test).
- s. C1567 - Potential alkali-silica Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated Mortar-bar method).
- t. D3963/D and 3963M - Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars.
- 2. ACI - American Concrete Institute:
 - a. 117 - Standard Tolerances for Concrete Construction and Materials.
 - b. 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
 - c. 224.3R – Joints in Concrete Construction.
 - d. 302.1R - Guide for Concrete Floor and Slab Construction.
 - e. 303R - Guide to Cast-In-Place Architectural Concrete Practice.
 - f. 304R - Guide for Measuring, Mixing, Transporting and Placing Concrete.
 - g. 304.2R Placing Concrete by Pumping Methods.
 - h. 305R - Hot Weather Concreting.
 - i. 306R - Cold Weather Concreting.
 - j. 309R - Guide for Consolidation of Concrete.
 - k. 330 - Guide for Design and Construction of Concrete Parking Lots.
 - l. 360 - Design of Slabs on Grade.
- 3. Concrete Reinforcing Steel Institute (CRSI):
 - a. Manual of Standard Practice – current edition.
 - b. Placing Reinforcing Bars – current edition.
- 4. Americans with Disabilities Act (ADA).
- 5. MDOT Current Standards:
 - a. Specifications for Construction.
 - b. Standard Plans.
- 6. St. Clair County Road Commission (SCCRC) Requirements.
- 7. The City of Port Huron Requirements.

1.04 SUBMITTALS

- A. Action Submittals:
 - 1. Provide mix design(s) for concrete to be supplied.
 - a. Include quantities and sources of all aggregates, cement, cementitious materials, and admixtures to be used.
 - b. Submitted from a MDOT certified testing laboratory regularly engaged in designing and testing concrete for exterior paving.
 - c. Use test results for mix design from within the past 12 months.
 - 2. Product Data: Submit Manufacturer's product data with application and installation instructions for admixtures, curing compounds, expansion joint fillers and sealants.

3. Alkali-Silica Reactivity (ASR):
 - a. Submit to ENGINEER ASTM C1260 Accelerated mortar bar test, and ASTM C1293 Concrete prism expansion for ASR from aggregate supplier.
 - b. Documentation may include previous testing (within previous 1 year) of materials and sources intended for use.
 - c. Documentation may include previous testing (within previous 1 year) from other projects or records provided by the material suppliers.

1.05 QUALITY ASSURANCE

- A. Pre-Paving Meeting:
 1. Meeting held at a time mutually agreed upon with ENGINEER, OWNER, CONTRACTOR and subcontractors involved in the paving work.
 2. Discussion of proposed schedule and methods of accomplishing all phases of the paving work.
 3. Minutes distributed to all in attendance.
- B. Installation Personnel Qualifications:
 1. Trained and experienced in the fabrication and installation of the materials and equipment.
 2. Knowledgeable of the design.
- C. Testing of Materials:
 1. In accordance with Section 01 40 00 "Quality Requirements."
 2. In accordance with approved CONTRACTOR's Quality Control Plan.
 3. In accordance with all applicable standards.
- D. Batch tickets: Furnish batch tickets to ENGINEER, or ENGINEER'S representative for material incorporated in the Project to verify that the required concrete mix has been supplied.
- E. Batch Plant Certification: Ensure portland cement concrete batch plant is certified to meet the requirements specified in the National Ready Mixed Concrete Association *Certification of Ready Mixed Concrete Production Facilities Quality Control Manual* or other MDOT approved requirements.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during, and after installation.
- B. Reject damaged, deteriorated or contaminated material and immediately remove from the Site. Replace rejected materials with new materials at no additional cost to OWNER.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Concrete Reinforcement:
 - 1. Welded wire fabric in accordance with ASTM A185, yield stress 65,000 psi.
 - 2. Reinforcing bars in accordance with ASTM A615, yield stress 60,000 psi.
- B. Cement:
 - 1. Portland cement: ASTM C150, Type IA.
 - 2. For high early strength concrete the cement shall be air-entraining portland cement Type IIIA.
 - 3. Do not use different Manufacturers of cement, or different degrees of fineness.
- C. Cementitious Materials or Cement Substitutes:
 - 1. Fly Ash: ASTM C618, Class C or F.
 - 2. Ground Granulated Blast Furnace Slag (GGBFS):
 - a. ASTM C989 Grade 100 minimum.
 - b. Use only as a blending material with Type I or Type IA portland cement.
 - 3. Silica Fume, Dry-Densified:
 - a. ASTM C1240.
 - b. Use only as a blending material with Type I or Type IA portland cement.
 - 4. Reduce the cement quantity up to a maximum of 25% for fly ash substitution or up to 30% for GGBFS substitution.
 - 5. Fly ash or GGBFS weight additions must equal the weight of the cement reduction.
 - 6. For concrete containing portland cement, fly ash and GGBFS in the same mix design, reduce the cement quantity up to 40%, with the maximum fly ash quantity not exceeding 15%.
- D. Aggregates:
 - 1. Grade aggregates according to procedures of ASTM C136, Class M, Exposure 4.
 - 2. Coarse Aggregates: ASTM C33, Number 57 (1-inch), crushed limestone.
 - 3. Fine Aggregate: ASTM C33.
 - 4. Test all aggregates for alkali-silica reactivity and provide mitigation method, if required.
- E. Water: Clean, fresh and potable.
- F. Steel Reinforcement:
 - 1. Reinforcement shall meet MDOT Standard Specifications.

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2. Deformed bars that conform to ASTM A706 or Grade 60 steel bars ASTM A615.
 3. Bars for Dowels or Lane Ties: Conform to Grade 40 ASTM A615 or A617.
 4. Welded Wire Fabric: Conform to ASTM A185.
 5. Epoxy Coating:
 - a. Where required, conform to ASTM D3963/D3963M.
 - b. Select coating material from MDOT qualified products list.
 - c. Provide certification, if required by ENGINEER, that material conforms to standards.
 - d. Use bar chairs and wire ties that are plastic coated, epoxy coated or plastic.
- G. Epoxy Coating Material:
1. Corrosion Protection Coatings:
 - a. One part, heat curable, thermosetting powdered epoxy.
 - b. Conforming with ASTM A775.
 2. Epoxy Coating Patching Material:
 - a. Compatible with factory applied epoxy coating.
 - b. Conforming with ASTM A775.
- H. Synthetic Fibers:
1. Synthetic fibers are fibers manufactured from polymer-based materials such as polypropylene, nylon and polyethylene telephthalate.
 2. Monofilament or fibrillated polypropylene designed for use in concrete pavement.
- I. Admixtures:
1. General:
 - a. No admixture shall contain more than 0.1% water soluble chloride ions by mass of cementitious material.
 - b. No admixture shall contain calcium chloride.
 2. Air-Entraining:
 - a. Required in all mixtures.
 - b. Comply with ASTM C260.
 - c. Daravair series or Darex series, by W.R. Grace & Company; Micro Air, by BASF Admixtures, Inc.; or equal.
 3. Water-Reducing Admixtures:
 - a. Provide concrete mixtures with the same strength, air content as the respective concrete without the admixture.
 - b. Select water reducing admixtures from MDOT's qualified products list.
 - c. Admixture dosage rates are based on the total cementitious material (cement plus fly ash or GGBFS).
- J. Curing Agents:
1. Comply with ASTM C309, Type 2, Class B.

2.02 CONCRETE MIX DESIGN

- A. Concrete shall conform to Grade 3500 as shown in Table 1004-1 of the MDOT Specifications. Design mix to project normal-weight concrete consisting of a mixture of portland cement, blended portland cement, cement substitutes, fine aggregate, coarse aggregate, water and admixtures, when required or permitted, producing the following properties:
1. Cement Content: 5.6 sack (526 lbs).
 2. Compressive Strength: 3,500 psi (min) at 28 days.
 3. Air Content: 6.5% $\pm$ 1.5%.
 4. Slump: 0 to 3 inches or the slump in the approved mix design.
 5. Water Cement Ratio: 0.45 maximum.
- B. Alkali-Silica Reactivity (ASR):
1. The Concrete supplier is required to evaluate the fine aggregates (only) used in the production of the concrete for ASR.
 2. Submit to the ENGINEER ASTM C1260 Accelerated mortar bar test for ASR from the aggregate supplier.
 3. Submit to the ENGINEER ASTM C1293 Concrete prism expansion for ASR from the aggregate supplier if available, or if necessary.
 4. Documentation may include previous testing of materials so long as material source has not changed, and test is not more than 1 year old.
 5. No ASR mitigation is required if aggregates are non-reactive where ASTM C1260 Accelerated mortar bar test expansion is less than 0.10% at 14 days, or if ASTM C1293 Concrete prism expansion is less than 0.04% at 1 year.
 6. If ASTM C1260 mortar bar test results is more than 0.10% expansion at 14 days, ASTM C1293 concrete prism test is required to be performed before aggregates can be used.
 7. ASR mitigation is required if aggregates are found to be moderately reactive where ASTM C1293 Concrete prism expansion is equal to or greater than 0.04%, but less than 0.12% at 1 year.
 8. Aggregates will not be accepted if ASTM C1293 Concrete prism expansion is equal to or greater than 0.12% at 1 year.
- C. Mitigation Methods for Moderately Reactive Aggregates:
1. In accordance with MDOT approved Specifications.
 2. Use low Alkali Cements:
 - a. Submit mill test report data and calculations for Cement and Fly Ash.
 - b. Maximum Alkali content of cementitious materials (cement and fly ash) (Na₂O_e) (Na₂O equivalent) $\leq$ 3.5 lbs/cyd.
 - c. Maximum Alkali content in cement (Na₂O_e) (Na₂O equivalent) $\leq$ 0.7%.
 - d. Maximum lime CaO in Fly ash $\leq$ 20%.
 - e. Minimum Silica in Fly ash SiO₂ $\geq$ 35%.
 - f. Total oxides in Fly ash (SiO₂ + Al₂O₃ + Fe₂O₃) $\geq$ 60%.

3. Demonstrate the effectiveness of the proposed mix combination to resist the potential for excessive expansion caused by ASR using current and historic data:
 - a. ASTM C1567 (14 day test) using both coarse and fine aggregate and all cementitious materials.
 - b. Mortar bars constructed of cementitious materials and coarse and fine aggregates must produce an expansion of less than 0.10%.

2.03 FORM WORK

- A. Provide necessary form work to provide concrete dimensions indicated on the Drawings $\pm 1/2$ inch.
 1. Forms to be straight and true, minimum 1 5/8-inch thick wood, full depth of concrete or steel forms.
 2. All curved radius pours to be smooth deflectable steel or wood forms.

2.04 CONTRACTION JOINTS

- A. Provide necessary contraction joints to control random cracking with sawcut or hand-troweled joint.
 1. Depth: 1/4 slab thickness minimum, or as indicated on the Drawings.
 2. Spacing according to St. Clair County Road Commission Requirements.
 3. Cut in location as indicated on the Drawings.
 4. Keep panels as square as possible with length not more than 25% greater than width.

2.05 ISOLATION (EXPANSION) JOINTS

- A. Joint fiber shall be preformed, composed of either blended, bonded flexible and waterproof fiber meeting the requirements of AASHTO M213 or polyvinyl chloride with fabric strand.
- B. Full depth of concrete.

2.06 SEALANTS

- A. Joint sealant to be hot-poured rubber in accordance with MDOT requirements.

2.07 PAVEMENT MARKINGS

- A. Marking paint shall meet Federal Specification GSA-FSSTT-P-115E Type 1.
- B. Size and Color: 4-inch or 6-inch width, white, yellow, blue or other color depending on intended use.
 1. As indicated on the Drawings.
 2. In accordance with guidelines, MMUTCD and FHWA – MUTCD.

- C. Traffic paint shall be waterborne spray type for stripe marking. If seasonal limitations prevent the placement of waterborne paint, the ENGINEER may approve regular dry paint. Select pavement marking materials from the MDOT Qualified Product List.
- D. Glass beads shall meet MDOT requirements with the exception of bead coating for waterborne pavement marking paint. The bead used in waterborne pavement marking shall have a moisture resistant coating and an adhesion promoting silane coating.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Test subgrade, subbase or aggregate base for density.
 - 1. Rework surfaces that have become too wet or dry to provide the required density.
 - 2. Required Density: Minimum 95% of Maximum Density.
- B. Proof of Test Rolling:
 - 1. Field test the uniformity and stability of the subgrade, subbase, or base.
 - 2. Loaded dump truck or other approved equipment over entire area in each of 2 perpendicular directions.
 - 3. Areas indicated or as designated by ENGINEER or field representative.
 - 4. In presence of ENGINEER or field representative.
 - 5. Repair/undercut unstable or yielding areas as directed.
- C. Fine Grading:
 - 1. Immediately prior to placing paving materials, test the subgrade or aggregate base course for conformity to the elevations and cross-section as indicated on the Drawings.
 - 2. Fine grade as necessary to bring base course into conformance with the proper elevation and cross-section.
 - 3. Compact areas which have been re-graded to minimum 95% Maximum Density.
- D. Do not place concrete until the surface to be paved upon has been inspected and approved by ENGINEER.

3.02 INSTALLATION

- A. Weather, Temperature, and other Limitations:
 - 1. Do not place concrete until the ambient air temperature away from artificial heat is at least 25 degrees F and rising, unless otherwise approved by ENGINEER.
 - 2. Do not place concrete if portions of the base, subbase, or subgrade layer are frozen, or if the grade exhibits poor stability from excessive moisture levels.

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3. Temperature of concrete at time of placement shall be between 45 degrees F and 90 degrees F.
 4. Paving will not be allowed between November 15 and May 1 without written approval from the St. Clair County Road Commission and City Engineer.
- B. Cold Weather Concrete Operations:
1. Comply with the recommendations of ACI 306R.
 2. Recommended Protective Measures:
 - a. Heating materials.
 - b. Providing insulating blankets and windbreaks.
 - c. Heated enclosures.
 - d. Advise ENGINEER of planned protective measures.
 - e. Straw or similar materials are not allowed.
 3. Do not use frozen materials or materials containing ice or snow.
 4. Do not place concrete on frozen subgrade.
- C. Hot Weather Concrete Operations:
1. Comply with the recommendations of ACI 305R.
 2. Recommended Protective Measures:
 - a. Cooling materials.
 - b. Concrete placement during cooler hours of the day.
 - c. Providing shading and windbreaks.
 3. Advise ENGINEER of planned protective measures.
- D. Preparation of Base:
1. Excavate to the required depth and to a width that will permit forming.
 2. Remove unsuitable material below the required depth and replace with suitable material approved by the ENGINEER.
 3. Shape and compact the base to conform to the section indicated on the Drawings.
- E. Forms:
1. Use fixed forms.
 2. Apply form releasing agent to prevent concrete from bonding to forms.
 3. Provide straight, full depth forms free of warp and strong enough to resist springing during concrete placement.
 4. Firmly stake fixed forms to prohibit movement.
- F. Placing and Finishing Concrete:
1. Place all concrete in accordance with ACI 304R and ACI 304.2R.
 2. Do not exceed the time limits specified in Table 1001-1 of the MDOT Specifications for the time of charging the mixer to complete concrete discharge.
 3. Moisten base before placing concrete.
 4. Place concrete and consolidate, including along the faces of the forms, before finishing.

5. Place and finish in a continuous operation.
6. When replacing gutters along with concrete walk ramps, construct the gutter to the same dimensions and profile and use the same reinforcement pattern as the existing gutter.
7. Float the surface just enough to produce a smooth surface free from irregularities.
8. Round edges and joints with an approved finishing tool.
9. Broom finish concrete walks and ramps by drawing a fine-hair broom across the concrete surface, perpendicular to the line of traffic. Repeat operation if required to provide a fine line texture acceptable to the ENGINEER.

G. Joints:

1. General: Comply with ACI 318-6.3, 6.4, and ACI 301, Section 6.
 - a. Construct expansion, weakened-plane (contraction), and construction joints true-to-line with face perpendicular to surface of concrete.
 - b. Construct transverse joints at right angles to the centerline, unless otherwise indicated.
 - c. Seal joints with hot-poured rubber asphalt in accordance with St. Clair County Road Commission joint standard details.
2. Weakened-Plane (Contraction) Joints:
 - a. Provide weakened-plane (contraction) joints, sectioning concrete into areas:
 - 1) As indicated on the Drawings.
 - 2) 24 to 36 times the thickness of the slab if not indicated on the Drawings.
 - b. Contraction joints for curbs shall be provided at maximum 10 foot intervals and maximum 15 foot spacing for slabs, unless indicated otherwise.
 - c. Construct weakened-plane joints for a depth equal to at least 1/4 concrete thickness, as follows:
 - 1) Tooled Joints: Form weakened-plane joints in fresh concrete by grooving top portion with a recommended cutting tool and finishing edges with a jointer.
 - 2) Sawed Joints: Form weakened-plane joints using powered saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut joints into hardened concrete as soon as surface will not be torn, abraded, or otherwise damaged by cutting action.
3. Construction Joints: Place construction joints at end of placements and at locations where placement operations are stopped for a period of more than 1/2 hour, except where such placements terminate at expansion joints.
4. Expansion Joints:
 - a. Provide premolded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks and other fixed objects, unless otherwise indicated.

- b. Locate expansion joints at 100 feet on center along linear lengths of curb and walks, and at points of radii of curbs unless otherwise indicated.
 - 5. Extend joint fillers full width and depth of joint, and not less than 1/2 inch or more than 1 inch below finished surface for joint sealant.
 - 6. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than 1 length is required, lace or clip joint filler sections together.
- H. Reinforcing:
- 1. Install reinforcing as indicated on the Drawings.
 - 2. Install in accordance with CRSI for placing reinforcing bars and Manual of Standard Practice.
- I. Epoxy Coating:
- 1. Minimum 6 mils thick and uniform.
 - 2. Coat reinforcement after fabrication.
 - 3. Repair damage to epoxy coating in accordance with:
 - a. ASTM A775.
 - b. Epoxy-coating Manufacturer's recommendations.
- J. Backfilling:
- 1. After the concrete has gained sufficient strength, remove fixed forms and backfill with suitable material approved by the ENGINEER.
 - 2. Compact and level the backfill 1-inch below the surface of the concrete.

3.03 CONCRETE FINISHING

- A. After striking-off and consolidating concrete, smooth surface by screening and floating. Use hand method only where mechanical floating is not possible. Adjust floating to compact surface and produce uniform texture.
- B. After floating, test surface for trueness with a 10 foot straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous smooth finish.
- C. Work edges of slabs, and formed joints with an edging tool, and round to 1/2 inch radius, unless otherwise indicated. Eliminate tool marks on concrete surface.

- D. After completion of floating and troweling when excess moisture or surface sheen has disappeared, complete surface finishing, as follows:
 - 1. Exterior slabs and concrete pavement types shall have a non-slip finish by scoring the surface with a heavy broom, perpendicular to the line of traffic.
 - 2. Repeat operation if required to provide a line texture acceptable to the ENGINEER.

3.04 CURING

- A. General:
 - 1. As soon as possible, after texturing operations have been completed and after the free water has left the surface, coat the concrete walk surface and sides of slip-formed concrete walks with a uniform layer of membrane curing compound.
 - 2. Apply 1 coat of curing compound on non-grooved surfaces and 2 coats on grooved surfaces.
 - 3. Apply not less than 1 gallon per 25 square yards of concrete for each application.
 - 4. Apply the second coat after the first has dried sufficiently but do not exceed 2 hours between coats.
 - 5. Keep the compound thoroughly mixed according to the Manufacturer's recommendations.
 - 6. Do not thin curing compound.
 - 7. Reapply curing compound immediately to surfaces damaged by rain, joint sawing, foot traffic or other activities.
 - 8. If fixed forms are removed during the curing period, coat the entire area of the sides of the concrete walk with curing compound immediately after removal of forms.
- B. These requirements are minimum requirements only.
- C. Repair or replacement of concrete showing damage due to inadequate curing is required.
- D. All costs associated with this corrective work will be borne by the CONTRACTOR.

3.05 PROTECTION

- A. Protect the concrete from damage until acceptance of the Work.
- B. Protect the concrete from freezing until the concrete has attained a compressive strength of at least 1800 psi.
- C. Maintain surface as clean by removing surface stains and spillage of materials as they occur.
- D. Sweep concrete and wash free of stains, discolorations, dirt and other foreign material just prior to final inspection.

3.06 DEFECTIVE WORK

- A. The following list of deficiencies are considered defective work and removal or replacement by the CONTRACTOR at no cost to the OWNER is required:
 - 1. Difference in elevation between panels of 1/2-inch or greater.
 - 2. Cracks of any lengths that are 1/8-inch wide or wider.
 - 3. Surface spalling covering in excess of 20% of the area of any 1 panel.
 - 4. A hole that is 1/2-inch or greater in depth and 2 inches or greater in diameter.
 - 5. Residual splatter that is 1/2-inch or higher and attached to a panel.
 - 6. Elevation difference of 3/4-inch in 10 feet caused by settling, that has not caused an elevation difference between panels.
 - 7. Multiple hairline cracking.
 - 8. Footprints, bike tire tracks, animal tracks, or the like, created while concrete was not cured.
 - 9. ASR cracking or potholing.
 - 10. Other work identified as defective by OWNER.

3.07 PAVEMENT MARKING

- A. Apply pavement marking in accordance with SCCRC, MDOT, and FHWA requirements.
- B. Clean pavement surface of sand, dirt, oil, and free of foreign material. Remove curing compound from new concrete surfaces before applying cold plastic tape.
- C. Pavement surface shall be dry:
 - 1. Apply waterborne paint when the surface temperatures of the pavement is 50 degrees F or higher.
 - 2. Apply regular dry paint when the surface temperature of the pavement is 25 degrees F or higher.
 - 3. Wait at least 14 days after the surface is placed to apply regular dry pavement markings unless otherwise approved by the ENGINEER.
- D. Follow Drawings for layout of pavement markings, symbols, and the like.
- E. Apply pavement marking uniformly to the surface, with sharp and well-defined edges.
- F. Protect pavement marking from traffic crossing over uncured paint.
- G. Apply second coat of paint to areas designated by ENGINEER just prior to Project completion.

3.08 CLEAN-UP

- A. For duration of work, CONTRACTOR is to maintain work area free of waste material, debris, and the like.
- B. CONTRACTOR shall provide on-site containers as necessary for work of this Section. Locate as directed by ENGINEER.
- C. Upon completion and when directed by ENGINEER, CONTRACTOR shall remove all excess material, debris, and equipment.
- D. Prior to acceptance of the work, clean the pavement and related areas to remove dirt and stones.

END OF SECTION 32 13 13

SECTION 32 13 14 – CONCRETE WALKS AND DRIVEWAYS

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes the furnishing and installation of concrete walks and concrete driveways.

1.02 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Sidewalk, Conc, (of the thickness specified), Modified:
 - 1. Basis of Measurement: Square feet (SF) for the actual number of square feet of sidewalk constructed.
 - 2. Basis of Payment: Furnishing all labor, equipment, and materials necessary to construct the sidewalk, including the cost of any permits required; excavating and preparing the subbase; furnishing, placing, and compacting MDOT Class II sand cushion; placing, finishing, and curing the sidewalk; and all related cleanup and grading of the Work area.
- B. Concrete Sidewalk Ramp (of the thickness specified):
 - 1. Basis of Measurement: Square feet (SF) for the actual number of square feet of sidewalk ramp and level landing constructed.
 - 2. Basis of Payment: Furnishing all labor, equipment, and materials necessary to construct the sidewalk ramp and level landing, including the cost of any permits required; excavating and preparing the subbase; furnishing, placing, and compacting MDOT Class II sand cushion; placing, finishing, and curing the sidewalk ramp; level landing; monolithic rolled curbs or side flares along the longitudinal edges of the ramp or landing; curb and gutter openings; and all related cleanup and grading of the Work area.
- C. ADA Sidewalk Ramp Tactile Warning Plate:
 - 1. Basis of Measurement: Square feet (SF) for actual number of square feet of tactile warning plate placed.
 - 2. Basis of Payment: Furnish and place warning plate at locations indicated on drawings.
- D. Concrete Driveway (of the thickness specified):
 - 1. Basis of Measurement: Square yards (SY) for the actual number of square yards of concrete driveway constructed.
 - 2. Basis of Payment: Furnishing all labor, equipment, and materials necessary to construct the concrete driveway, including the cost of any permits required; excavating and preparing the subbase; furnishing, placing, and compacting base material; placing, finishing, and curing the driveway; and all related cleanup and grading of the Work area.

1.03 REFERENCES

- A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
1. ASTM Publications:
 - a. A185 - Steel Welded Wire, Fabric, Plain for Concrete Reinforcement.
 - b. A820 - Steel Fibers for Fiber Reinforced Concrete.
 - c. C33 - Specification for Concrete Aggregates.
 - d. C39 - Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 - e. C94 - Specification for Ready-Mixed Concrete.
 - f. C136 - Sieve Analysis of Fine and Coarse Aggregates.
 - g. C150 - Specification for Portland Cement.
 - h. C260 - Specification for Air-Entraining Admixtures for Concrete.
 - i. C309 - Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 - j. C330 - Specification for Lightweight Aggregates for Structural Concrete.
 - k. C494 - Specification for Chemical Admixtures for Concrete.
 - l. C618 - Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.
 2. ACI – American Concrete Institute:
 - a. 117 - Standard Tolerances for Concrete Construction and Materials.
 - b. 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
 - c. 224.3R – Joints in Concrete Construction.
 - d. 302.1R - Guide for Concrete Floor and Slab Construction.
 - e. 303R - Guide to Cast-In-Place Architectural Concrete Practice.
 - f. 304R - Guide for Measuring, Mixing, Transporting and Placing Concrete.
 - g. 305R - Hot Weather Concreting.
 - h. 306R - Cold Weather Concreting.
 - i. 309R - Guide for Consolidation of Concrete.
 3. Americans with Disabilities Act (ADA).
 4. MDOT Current Standards:
 - a. Specifications for Construction.
 - b. Standard Plans.
 5. St. Clair County Road Commission (SCCRC) Requirements.
 6. The City of Port Huron Requirements.

1.04 SUBMITTALS

- A. Action Submittals:
1. Provide mix design for concrete to be supplied.

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
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- a. Include quantities and sources of all aggregates, cement, cementitious materials, and admixtures to be used.
 - b. Submitted from a MDOT certified testing laboratory regularly engaged in designing and testing concrete for exterior paving.
 - c. Use test results for mix design from within the past 12 months.
2. Product Data: Submit Manufacturer's product data with application and installation instructions for admixtures, curing compounds, expansion joint fillers and sealants.
3. Alkali-Silica Reactivity (ASR):
 - a. Submit to ENGINEER ASTM C1260 Accelerated mortar bar test, and ASTM C1293 Concrete prism expansion for ASR from aggregate supplier.
 - b. Documentation may include previous testing (within previous 1 year) of materials and sources intended for use.
 - c. Documentation may include previous testing (within previous 1 year) from other projects or records provided by the material suppliers.
4. Stamped Colored Concrete
 - a. Concrete Colorant:
 - 1) Submit to OWNER standard pigment color options to choose from.
 - 2) Documentation to include source/manufacturer of the product, release agent, curing compound, surface sealer.

1.05 QUALITY ASSURANCE

- A. Pre-Paving Meeting:
 1. Meeting held at a time mutually agreed upon with ENGINEER, OWNER, CONTRACTOR and subcontractors involved in the paving work.
 2. Discussion of proposed schedule and methods of accomplishing all phases of the paving work.
 3. Minutes distributed to all in attendance.
- B. Installation Personnel Qualifications:
 1. Trained and experienced in the fabrication and installation of the materials and equipment.
 2. Knowledgeable of the design.
 3. Contractor has a Michigan Concrete Association (MCA) Decorative Concrete Certification, or proven equivalent manufacturer training and certification for placing decorative concrete.
- C. Testing of Materials:
 1. In accordance with Section 01 40 00 "Quality Requirements."
 2. In accordance with approved CONTRACTOR's Quality Control Plan.
 3. In accordance with all applicable standards.

- D. Batch tickets: Furnish batch tickets to ENGINEER, or ENGINEER'S representative for material incorporated in the Project to verify that the required concrete mix has been supplied.
- E. Batch Plant Certification: Ensure portland cement concrete batch plant is certified to meet the requirements specified in the National Ready Mixed Concrete Association *Certification of Ready Mixed Concrete Production Facilities Quality Control Manual* or other MDOT approved requirements.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during, and after installation.
- B. Reject damaged, deteriorated or contaminated material and immediately remove from the Site. Replace rejected materials with new materials at no additional cost to OWNER.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Cement:
 - 1. Portland cement, ASTM C150, Type IA or I/II.
 - 2. For high early strength concrete the cement shall be air-entraining portland cement Type IIIA.
 - 3. Do not use different types of cement, different manufacturers of cement, or different degrees of fineness.
- B. Cementitious Materials or Cement Substitutes:
 - 1. Fly Ash: ASTM C618, Class C or F.
 - 2. Ground Granulated Blast Furnace Slag (GGBFS):
 - a. ASTM C989 Grade 100 minimum.
 - b. Use only as a blending material with Type I or Type IA portland cement.
 - 3. Silica Fume, Dry-Densified:
 - a. ASTM C1240.
 - b. Use only as a blending material with Type I or Type IA portland cement.
 - 4. Reduce the cement quantity up to a maximum of 25% for fly ash substitution or up to 30% for GGBFS substitution.
 - 5. Fly ash or GGBFS weight additions must equal the weight of the cement reduction.
 - 6. For concrete containing portland cement, fly ash and GGBFS in the same mix design, reduce the cement quantity up to 40%, with the maximum fly ash quantity not exceeding 15%.

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- C. Aggregates:
 - 1. Granular Material Class II in accordance with Section 902 of the 2020 MDOT Standard Specifications for Construction
 - 2. Grade aggregates according to procedures of ASTM C136, Class M, Exposure 4.
 - 3. Coarse Aggregates: ASTM C33-5S, Number 57 (1-inch), crushed limestone.
 - 4. Fine Aggregate: ASTM C33.
 - 5. Test all aggregates for alkali-silica reactivity and provide mitigation method, if required.
- D. Water: Clean, fresh and potable.
- E. Admixtures:
 - 1. General:
 - a. No admixture shall contain more than 0.1% water soluble chloride ions by mass of cementitious material.
 - b. No admixture shall contain calcium chloride.
 - 2. Air-Entraining:
 - a. Comply with ASTM C260.
 - b. Daravair series or Darex series, by W.R. Grace & Company; Micro Air, by BASF Admixtures, Inc.; or equal.
 - 3. Water-Reducing Admixtures:
 - a. Provide concrete mixtures with the same strength, air content as the respective concrete without the admixture.
 - b. Select water reducing admixtures from MDOT's qualified products list.
 - c. Admixture dosage rates are based on the total cementitious material (cement plus fly ash or GGBFS).
- F. Release Agent:
 - 1. Dry-shake powder to facilitate release of imprinting tools as manufactured by Brickform Rafco or Prism Pigments.
- G. Curing Agents:
 - 1. Curing agents shall comply with ASTM C309, Type 2, Class B.
 - 2. Colored Concrete: Use transparent curing compound meeting subsection 903.05B of the MDOT Standard Specifications for Construction. [ASTM C 309, Type 1 or 1D]. Standard curing compounds cannot be used on colored concrete.
- H. Surface Sealer:
 - 1. Use a "crystal clear" Class A solvent acrylic decorative sealer in low-sheen, anti-slip form from approved list below, or other as approved by the system manufacturer and the ENGINEER.
 - a. Brickform – Safety-Seal MS-5
 - b. Vexcon Chemicals
 - 1) Certivex AC 1315 solvent vase sealer (with curing compounds)

- 2) Certivex Gloss Sealer FT solvent base sealer (without curing compounds)
- 3) Shur Grip – anti-slip sealer additive.

I. Concrete Reinforcement:

1. In accordance with MDOT requirements and drawings when required.
2. Welded wire fabric in accordance with ASTM A185.

2.02 CONCRETE MIX DESIGN

A. Concrete shall conform to Grade 3500 as shown in Table 1004-1 of the MDOT Specifications. Design mix to project normal-weight concrete consisting of portland cement, aggregate, add mixtures, and water producing the following properties:

1. Cement content: 5.6 sack (526 lbs).
2. Compressive Strength: 3,500 psi (min) at 28 days.
3. Air Content: 6.5% $\pm$ 1.5%.
4. Slump: 0 to 3 inches or the slump in the approved mix design.
5. Water Cement Ratio: 0.45 maximum.

B. Alkali-Silica Reactivity (ASR):

1. The Concrete supplier is required to evaluate the fine aggregates (only) used in the production of the concrete for ASR.
2. Submit to the ENGINEER ASTM C1260 Accelerated mortar bar test for ASR from the aggregate supplier.
3. Submit to the ENGINEER ASTM C1293 concrete prism expansion for ASR from the aggregate supplier if available, or if necessary.
4. Documentation may include previous testing of materials so long as material source has not changed, and test is not more than 1 year old.
5. No ASR mitigation is required if aggregates are non-reactive where ASTM C1260 accelerated mortar bar test expansion is less than 0.10% at 14 days, or if ASTM C1293 Concrete prism expansion is less than 0.04% at 1 year.
6. If ASTM C1260 mortar bar test results is more than 0.10% expansion at 14 days, ASTM C1293 concrete prism test is required to be performed before aggregates can be used.
7. ASR mitigation is required if aggregates are found to be moderately reactive where ASTM C1293 Concrete prism expansion is equal to or greater than 0.04%, but less than 0.12% at 1 year.
8. Aggregates will not be accepted if ASTM C1293 Concrete prism expansion is equal to or greater than 0.12% at 1 year.

C. Mitigation Methods for Moderately Reactive Aggregates:

1. In accordance with DOT approved Specifications.
2. Use low Alkali Cements:
 - a. Submit mill test report data and calculations for Cement and Fly ash.
 - b. Maximum Alkali content of cementitious materials (cement and fly ash) (Na₂O_e) (Na₂O equivalent) $\leq$ 3.5 lbs/cyd.

- c. Maximum Alkali content in cement (Na_2Oe) (Na_2O equivalent) $\leq 0.7\%$.
 - d. Maximum lime CaO in Fly ash $\leq 20\%$.
 - e. Minimum Silica in Fly ash $\text{SiO}_2 \geq 35\%$.
 - f. Total oxides in Fly ash ($\text{SiO}_2 + \text{Al}_2\text{O}_3 + \text{Fe}_2\text{O}_3$) $\geq 60\%$.
3. Demonstrate the effectiveness of the proposed mix combination to resist the potential for excessive expansion caused by ASR using current and historic data:
- a. ASTM C1567 (14 day test) using both coarse and fine aggregate and all cementitious materials.
 - b. Mortar bars constructed of cementitious materials and coarse and fine aggregates must produce an expansion of less than 0.10% .

2.03 SAND CUSHIONS AND SAND FILL

- A. Provide sand backfill material for sidewalk base consisting of natural sand composed of granular material resulting from the natural disintegration of rock. This material shall consist of clean, hard, durable, uncoated particles of sand, free from clay lumps and soft or flaky material. Sand used for backfill shall be 4 inches thick and conform to the gradation for Class II material specified in Section 902 of the MDOT Standard Specifications for Construction.

2.04 DETECTABLE/TACTILE WARNING SURFACES

- A. Furnish and install tactile surface plate into uncured concrete cement.
- 1. In accordance with most current Americans With Disabilities Act (ADA).
 - 2. Materials: As specified on The City of Port Huron Standard Detail Sheets.

2.05 FORM WORK

- A. Provide necessary form work to provide concrete dimensions indicated on the Drawings $\pm 1/2$ inch.
- 1. Forms to be straight and true, minimum $1\ 5/8$ -inch thick wood, full depth of concrete or steel forms.
 - 2. All curved radius pours to be smooth deflectable steel or wood forms.

2.06 CONTRACTION JOINTS

- A. Provide necessary contraction joints to control random cracking with sawcut or hand-troweled joint.
- 1. Depth: $1/4$ slab thickness minimum, or as indicated on the Drawings.
 - 2. Cut and space joints as indicated on the drawings.

2.07 EXPANSION JOINTS

- A. Joint fiber shall be preformed, composed of either blended, bonded flexible and waterproof fiber meeting the requirements of AASHTO M213 or polyvinyl chloride with fabric strand or ASTM D1751 fiber joint filler.
- B. Full depth of concrete.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Provide smooth 4-inch sand base compacted to at least 98 percent maximum density in accordance with ASTM D1557.
- B. Do not place concrete until the surface to be paved upon has been inspected and approved by ENGINEER.

3.02 INSTALLATION

- A. Weather, Temperature, and other Limitations:
 - 1. Do not place concrete until the ambient air temperature away from artificial heat is at least 25 degrees F and rising, unless otherwise approved by ENGINEER.
 - 2. Do not place concrete if portions of the base, subbase, or subgrade layer are frozen, or if the grade exhibits poor stability from excessive moisture levels.
 - 3. Temperature of concrete at time of placement shall be between 45 degrees F and 90 degrees F.
 - 4. Paving will not be allowed between November 15 and May 1 without written approval from the St. Clair County Road Commission and City Engineer.
- B. Cold Weather Concrete Operations:
 - 1. Comply with the recommendations of ACI 306R.
 - 2. Recommended Protective Measures:
 - a. Heating materials.
 - b. Providing insulating blankets and windbreaks.
 - c. Heated enclosures.
 - 3. Advise ENGINEER of planned protective measures.
 - 4. Straw or similar materials shall not be allowed.
 - 5. Do not use frozen materials or materials containing ice or snow.
 - 6. Do not place concrete on frozen subgrade.
- C. Hot Weather Concrete Operations:
 - 1. Comply with the recommendations of ACI 305R.
 - 2. Recommended Protective Measures:
 - a. Cooling materials.
 - b. Concrete placement during cooler hours of the day.

- c. Providing shading and windbreaks.
 3. Advise ENGINEER of planned protective measures.
- D. Slope:
 1. All walks should have a cross slope of a minimum 1% and maximum 2% sloped toward a curb or lower elevation.
- E. Preparation of Base:
 1. Excavate to the required depth and to a width that will permit forming.
 2. Remove unsuitable material below the required depth and replace with suitable material approved by the ENGINEER.
 3. Shape and compact the base to conform to the section indicated on the Drawings.
- F. Forms:
 1. Use fixed forms.
 2. Apply form releasing agent to prevent concrete from bonding to forms.
 3. Provide straight, full depth forms free of warp and strong enough to resist springing during concrete placement.
 4. Firmly stake fixed forms to prohibit movement.
- G. Placing and Finishing Concrete:
 1. Placing of concrete shall not commence until an approved inspection has been made of the forms and subgrade.
 2. Place all concrete in accordance with ACI 304R and ACI 304.2R.
 3. Do not exceed the time limits specified in Table 1001-1 of the MDOT Specifications for the time of charging the mixer to complete concrete discharge.
 4. Moisten base before placing concrete.
 5. Place concrete and consolidate, including along the faces of the forms, before finishing.
 6. Place and finish in a continuous operation.
 7. When replacing gutters along with concrete walk ramps, construct the gutter to the same dimensions and profile and use the same reinforcement pattern as the existing gutter.
 8. Float the surface just enough to produce a smooth surface free from irregularities.
 9. Round edges and joints with an approved finishing tool.
 10. Broom finish concrete walks, ramps, and driveways by drawing a fine-hair broom across the concrete surface, perpendicular to the line of traffic. Repeat operation if required to provide a fine line texture acceptable to the ENGINEER.
 11. Stamped Colored Concrete:
 - a. To impact desired texture/stamp, use high-quality resilient mats reproduced from casting of natural materials and proving uniform control of joint depth. Use tools capable of producing the selected pattern. Use imprinting tool(s) from approved manufacturer.

- b. Joints should take into account the pattern as approved in the mock-up.
- c. Color Release: Apply powder release per manufacturer guidelines at the minimum rate required to cover the previously colored surface. "Liquid Antique" agent can be used as a substitute for dry release. If clear liquid release is to be used, apply per manufacturer guidelines. Colored powder release can be mixed with clear liquid and sprayed on the surface only after imprinting has been completed, to create and accent coloring.
- d. Imprint Pattern: Comply with the tool manufacturer's standard and MCA practices. Lay out to proper alignment and imprint constant depth while concrete is plastic. Do not allow the surface to crust over or harden before stamping. Hand-tool in the areas where imprinting tools are not practical.
- e. Removal of Excess Release – Wash off excess release agent with normal water pressure prior to joints being cut. Remove a minimum of 80 percent of the release. Temperature conditions will dictate the timing of the release removal. Dispose of any excess release agent in compliance with local regulations.
- f. Acid washing of decorative surface may be required to achieve the desired finish, as directed by the Engineer. A minimum of 36 hours after placement, apply a solution of 1 part muriatic acid to 30 parts potable water to the surface of the pavement and lightly scrub with a straw broom. Wash the surface until proper color has been achieved and then flush thoroughly
- g. Sealing Decorative Surface – Seal the surface with approved sealer according to manufacturer's recommendation.

H. Joints:

- 1. General: Comply with ACI 318-6.3, 6.4, and ACI 301, Section 6.
 - a. Construct expansion, weakened-plane (contraction), and construction joints true-to-line with face perpendicular to surface of concrete.
 - b. Construct transverse joints at right angles to the centerline, unless otherwise indicated.
- 2. Weakened-Plane (Contraction) Joints:
 - a. Provide weakened-plane (contraction) joints, sectioning concrete into areas
 - 1) As indicated on the Drawings.
 - b. Contraction joints for curbs shall be provided at 10 foot intervals and 20 foot spacing for slabs, unless shown otherwise.
 - c. Construct weakened plane joints for a depth equal to at least 1/4 concrete thickness, as follows:
 - 1) Tooled Joints: Form weakened-plane joints in fresh concrete by grooving top portion with a recommended cutting tool and finishing edges with a jointer.

- 2) Sawed Joints: Form weakened-plane joints using powered saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut joints into hardened concrete as soon as surface will not be torn, abraded, or otherwise damaged by cutting action.
 3. Construction Joints: Place construction joints at end of placements and at locations where placement operations are stopped for a period of more than 1/2 hour, except where such placements terminate at expansion joints.
 4. Expansion Joints:
 - a. Provide premolded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks and other fixed objects, unless otherwise indicated.
 - b. Locate expansion joints at 50 feet on center along linear lengths of walks, and at points of radii of curbs unless otherwise indicated.
 5. Extend joint fillers full width and depth of joint, and not less than 1/2 inch or more than 1 inch below finished surface for joint sealant.
 6. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than 1 length is required, lace or clip joint filler sections together.
- I. Thickness: Except as otherwise specified or indicated on the Drawings, provide a minimum thickness of 4 inches for sidewalks, 6 inches for sidewalk ramps, and 6 inches for driveways.
- J. Where walkways cross driveways, provide a minimum thickness of 6 inches.
- K. Ramps:
 1. As indicated on the Drawings.
 2. No ramp shall exceed 1:12 slope.
 3. Place detectable warning domed plates in fresh concrete in accordance with Manufacturer's instructions on ramp surface.
 4. ADA domes to be 24 inches wide, full width of ramp.
- L. Reinforcing:
 1. Install reinforcing as indicated on the Drawings.
- M. Backfilling:
 1. After the concrete has gained sufficient strength, remove fixed forms and backfill with suitable material approved by the ENGINEER.
 2. Compact and level the backfill 1-inch below the surface of the concrete.

3.03 CONCRETE FINISHING

- A. After striking-off and consolidating concrete, smooth surface by screening and floating. Use hand method only where mechanical floating is not possible. Adjust floating to compact surface and produce uniform texture.

- B. After floating, test surface for trueness with a 10 foot straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous smooth finish.
- C. Work edges of slabs, and formed joints with an edging tool, and round to 1/2 inch radius, unless otherwise indicated. Eliminate tool marks on concrete surface.
- D. After completion of floating and troweling when excess moisture or surface sheen has disappeared, complete surface finishing, as follows:
 - 1. Exterior slabs, sidewalks, flow channels, flumes, curbs, and other similar concrete pavement types shall have a non-slip finish by scoring the surface with a fine-hair broom, perpendicular to the line of traffic. Repeat operation if required to provide a fine line texture acceptable to the ENGINEER.
- E. Do not remove forms for 24 hours after concrete has been placed. After form removal, clean ends of joints and point-up any minor honeycombed areas. Remove and replace areas or sections with major defects, as directed by ENGINEER.

3.04 CURING

- A. General:
 - 1. After texturing operations have been completed and after the free water has left the surface, coat the concrete walk surface and sides of slip-formed concrete walks with a uniform layer of membrane curing compound.
 - 2. Apply 1 coat of curing compound on non-grooved surfaces and 2 coats on grooved surfaces.
 - 3. Apply not less than 1 gallon per 25 square yards of concrete for each application.
 - 4. Apply the second coat after the first has dried sufficiently but do not exceed 2 hours between coats.
 - 5. Keep the compound thoroughly mixed according to the Manufacturer's recommendations.
 - 6. Do not thin curing compound.
 - 7. Reapply curing compound immediately to surfaces damaged by rain, joint sawing, foot traffic or other activities.
 - 8. If fixed forms are removed during the curing period, coat the entire area of the sides of the concrete walk with curing compound immediately after removal of forms.
- B. These requirements are minimum requirements only.
- C. Repair or replacement of concrete showing damage due to inadequate curing is required.
- D. All costs associated with this corrective work will be borne by the CONTRACTOR.

3.05 ADA TRUNCATED DOMES

- A. Prior to installation, review mix design with concrete supplier and installer to ensure concrete has proper slump and will not set too rapidly to allow for proper installation.
- B. Install system in accordance with Manufacturer's specifications and recommendations. Dome panels to be perpendicular and parallel with curb with no gaps between panels. Panels must be level and flush with adjacent concrete walk. Installation must be acceptable to ENGINEER or removed and replaced at CONTRACTOR's expense.
- C. Install top of domes flush with top of adjacent concrete along top and sides of plates. Install bottom of domes flush with concrete at lower end of plates.

3.06 PROTECTION

- A. Protect the walks and driveways from damage until acceptance of the Work.
- B. Protect the concrete from freezing until the concrete has attained a compressive strength of at least 1800 psi.
- C. Maintain walks and driveways as clean as practical by removing surface stains and spillage of materials as they occur.
- D. Sweep concrete walks and driveways and wash free of stains, discolorations, dirt and other foreign material just prior to final inspection.

3.07 DEFECTIVE WORK

- A. The following list of deficiencies shall be considered defective work and shall be replaced by the CONTRACTOR at no cost to the OWNER:
 - 1. Difference in elevation between panels of 1/2-inch or greater.
 - 2. Cracks of any length that are 1/8-inch wide or wider.
 - 3. Surface spalling covering in excess of 20% of the area of any 1 panel.
 - 4. A hole that is 1/2-inch or greater in depth and 2 inches or greater in diameter.
 - 5. Residual splatter that is 1/2-inch or higher and attached to a panel.
 - 6. Elevation difference of 3/4-inch in 10 feet caused by settling, that has not caused an elevation difference between panels.
 - 7. Multiple hairline cracking.
 - 8. Footprints, bike tire tracks, animal tracks, or the like, created while concrete was not cured.
 - 9. Improperly install tactile warning surface.
 - 10. ASR cracking or potholing.
 - 11. Other work identified as defective by OWNER.

3.08 CLEAN-UP

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- A. For duration of work, CONTRACTOR is to maintain work area free of waste material, debris, and the like.
- B. CONTRACTOR shall provide on-site containers as necessary for work of this Section. Locate as directed by ENGINEER.
- C. Upon completion and when directed by ENGINEER, CONTRACTOR shall remove all excess material, debris, and equipment.
- D. Prior to acceptance of the work, clean the pavement and related areas to remove dirt and stones.

END OF SECTION 32 13 14

SECTION 32 16 13 – CONCRETE CURBS AND GUTTERS

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes the furnishing and installation of concrete curbs and gutters and concrete driveway openings.

1.02 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. The cost of all work under this item shall be included in the cost of the Project and no separate payment shall be made therefore unless listed in the Bid Form as a Bid Item.
- B. When listed in the Proposal as a Bid Item:
 - 1. Concrete Curbs:
 - a. Basis of Measurement: Linear feet (LF) along the back of curb as installed.
 - b. Basis of Payment: Furnish all labor, equipment, and materials necessary to construct the curb as specified including excavation, compaction, bedding and backfill, disposal of excess excavated material, and seeding of backfill or sodding of backfill as required.
 - 2. Concrete Driveway Opening (of the type specified):
 - a. Basis of Measurement: Linear feet (LF) measured from springline to springline.
 - b. Basis of Payment: Furnish all labor, equipment, and materials necessary to construct the driveway opening as specified including reinforcement, excavation, compaction, bedding and backfill, disposal of excess excavated material, and seeding of backfill or sodding of backfill as required.

1.03 REFERENCES

- A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
 - 1. ASTM Publications:
 - a. A820 - Steel Fibers for Fiber Reinforced Concrete.
 - b. C33 - Specification for Concrete Aggregates.
 - c. C39 - Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 - d. C94 - Specification for Ready-Mixed Concrete.
 - e. C136 - Sieve Analysis of Fine and Coarse Aggregates.
 - f. C150 - Specification for Portland Cement.
 - g. C260 - Specification for Air-Entraining Admixtures for Concrete.
 - h. C309 - Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

- i. C330 - Specification for Lightweight Aggregates for Structural Concrete.
 - j. C494 - Specification for Chemical Admixtures for Concrete.
 - k. C618 - Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.
2. ACI – American Concrete Institute:
 - a. 117 - Standard Tolerances for Concrete Construction and Materials.
 - b. 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
 - c. 302.1R - Guide for Concrete Floor and Slab Construction.
 - d. 303R - Guide to Cast-In-Place Architectural Concrete Practice.
 - e. 304R - Guide for Measuring, Mixing, Transporting and Placing Concrete.
 - f. 305R - Hot Weather Concreting.
 - g. 306R - Cold Weather Concreting.
 - h. 309R - Guide for Consolidation of Concrete.
3. Concrete Reinforcing Steel Institute (CRSI):
 - a. Manual of Standard Practice – current edition.
 - b. Placing Reinforcing Bars – current edition.
4. Americans with Disabilities Act (ADA).
5. MDOT Current Standards:
 - a. Specifications for Construction.
 - b. Standard Plans.
6. St. Clair County Road Commission (SCCRC) Requirements.
7. The City of Port Huron Requirements.

1.04 SUBMITTALS

- A. Action Submittals:
 1. Provide mix design for concrete to be supplied.
 - a. Include quantities and sources of all aggregates, cement, cementitious materials, and admixtures to be used.
 - b. Submitted from a MDOT certified testing laboratory regularly engaged in designing and testing concrete for exterior paving.
 - c. Use test results for mix design from within the past 12 months.
 2. Product Data: Submit Manufacturer's product data with application and installation instructions for admixtures, curing compounds, expansion joint fillers and sealants.
 3. Alkali-Silica Reactivity (ASR):
 - a. Submit to ENGINEER ASTM C1260 Accelerated mortar bar test, and ASTM C1293 Concrete prism expansion for ASR from aggregate supplier.
 - b. Documentation may include previous testing (within previous 2 years) of materials and sources intended for use.
 - c. Documentation may include previous testing (within previous 2 years) from other projects or records provided by the material suppliers.

1.05 QUALITY ASSURANCE

- A. Pre-Paving Meeting:
 - 1. Meeting held at a time mutually agreed upon with ENGINEER, OWNER, CONTRACTOR and subcontractors involved in the paving work.
 - 2. Discussion of proposed schedule and methods of accomplishing all phases of the paving work.
 - 3. Minutes distributed to all in attendance.
- B. Installation Personnel Qualifications:
 - 1. Trained and experienced in the fabrication and installation of the materials and equipment.
 - 2. Knowledgeable of the design.
- C. Testing of Materials:
 - 1. In accordance with Section 01 40 00 "Quality Requirements."
 - 2. In accordance with approved CONTRACTOR's Quality Control Plan.
 - 3. In accordance with all applicable standards.
- D. Batch tickets: Furnish batch tickets to ENGINEER, or ENGINEER'S representative for material incorporated in the Project to verify that the required concrete mix has been supplied.
- E. Batch Plant Certification: Ensure portland cement concrete batch plant is certified to meet the requirements specified in the National Ready Mixed Concrete Association *Certification of Ready Mixed Concrete Production Facilities Quality Control Manual* or other MDOT approved requirements.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during, and after installation.
- B. Reject damaged, deteriorated or contaminated material and immediately remove from the Site. Replace rejected materials with new materials at no additional cost to OWNER.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Cement:
 - 1. Portland cement, ASTM C150, Type IA.
 - 2. For high early strength concrete the cement shall be air-entraining portland cement Type IIIA.
 - 3. Do not use different types of cement, different manufacturers of cement, or different degrees of fineness.

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- B. Fly Ash: ASTM C618, Class F.
- C. Aggregates:
 - 1. Grade aggregates according to procedures of ASTM C136, Class M, Exposure 4.
 - 2. Coarse Aggregates: ASTM C33-5S, Number 57 (1-inch), crushed limestone.
 - 3. Fine Aggregate: ASTM C33.
- D. Water: Clean, fresh and potable.
- E. Admixtures:
 - 1. General:
 - a. No admixture shall contain more than 0.1% water soluble chloride ions by mass of cementitious material.
 - b. No admixture shall contain calcium chloride.
 - 2. Air-Entraining:
 - a. Comply with ASTM C260.
 - b. Daravair series or Darex series, by W.R. Grace & Company; Micro Air, by BASF Admixtures, Inc.; or equal.
- F. Curing Agents:
 - 1. Curing agents shall comply with ASTM C309, Type 2, Class B.
- G. Concrete Reinforcement:
 - 1. Reinforcement shall meet MDOT Standard Specifications.
 - 2. Deformed reinforcing bars.
 - 3. ASTM A615, $F_y = 60,000$ psi.
 - 4. Required only when indicated on the Drawings.

2.02 CONCRETE MIX DESIGN

- A. Concrete shall conform to Grade 3500 as shown in Table 1004-1 of the MDOT Specifications. Design mix to project normal-weight concrete consisting of portland cement, aggregate, air-entrained add mixture, and water producing the following properties:
 - 1. Cement Content: 5.6 sack (526 lbs).
 - 2. Compressive Strength: 3,500 psi (min) at 28 days.
 - 3. Air Content: $6.5\% \pm 1.5\%$.
 - 4. Air content may be reduced to 4.5% if curb and gutter is being installed with slip-form machine.
 - 5. Slump: 0 to 3 inches unless mid-range water reducer is used then slump may be 6 inches.
 - 6. Water Cement Ratio: 0.45 maximum.
- B. Sand Cushions and Sand Fill: 4-inches of compacted granular material.

2.03 FORMWORK

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- A. Provide necessary formwork to provide concrete dimensions indicated on the Drawings $\pm 1/2$ inch.
 - 1. Forms to be straight and true, minimum 1 5/8-inch thick wood, full depth of concrete or steel forms.
 - 2. All curved radius pours to be smooth deflectable steel or wood forms.

2.04 CONTRACTION JOINTS

- A. Construct joints, as approved by the ENGINEER, to ensure a plane-of-weakness at least 1/4 the depth of the section.

2.05 EXPANSION JOINTS

- A. Joint fiber shall be preformed, composed of either blended, bonded flexible and waterproof fiber meeting the requirements of AASHTO M213 or polyvinyl chloride with fabric strand or ASTM D1751 fiber joint filler.

2.06 SEALANTS

- A. Joint sealant to be hot-poured rubber in accordance with MDOT requirements.

PART 3 - EXECUTION

3.01 GRADING

- A. Provide smooth base of granular material compacted to 95% of its maximum density in accordance with ASTM D1557.

3.02 INSTALLATION

- A. Weather, Temperature, and other Limitations:
 - 1. Do not place concrete until the ambient air temperature away from artificial heat is at least 25 degrees F and rising, unless otherwise approved by ENGINEER.
 - 2. Do not place concrete if portions of the base, subbase, or subgrade layer are frozen, or if the grade exhibits poor stability from excessive moisture levels.
 - 3. Temperature of concrete at time of placement shall be between 45 degrees F and 90 degrees F.
 - 4. Paving will not be allowed between November 15 and May 1 without written approval from the St. Clair County Road Commission.
- B. Cold Weather Concrete Operations:
 - 1. Comply with the recommendations of ACI 306R.
 - 2. Recommended Protective Measures:
 - a. Heating materials.
 - b. Providing insulating blankets and windbreaks.
 - c. Heated enclosures.
 - 3. Advise ENGINEER of planned protective measures.

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4. Straw or similar materials shall not be allowed.
 5. Do not use frozen materials or materials containing ice or snow.
 6. Do not place concrete on frozen subgrade.
- C. Hot Weather Concrete Operations:
1. Comply with the recommendations of ACI 305R.
 2. Recommended Protective Measures:
 - a. Cooling materials.
 - b. Concrete placement during cooler hours of the day.
 - c. Providing shading and windbreaks.
 3. Advise ENGINEER of planned protective measures.
- D. Preparation of Base:
1. Excavate to the required depth and to a width that will permit forming.
 2. Remove unsuitable material below the required depth and replace with suitable material approved by the ENGINEER.
 3. Shape and compact the base to conform to the section indicated on the Drawings.
- E. Forms:
1. Use fixed forms.
 2. Apply form releasing agent to prevent concrete from bonding to forms.
 3. Provide straight, full depth forms free of warp and strong enough to resist springing during concrete placement.
 4. Firmly stake fixed forms to prohibit movement.
- F. Reinforcing:
1. Place reinforcement in accordance with CRSI placing reinforcement bars and Manual of Standard Practice.
 2. Tolerances indicated in ACI 117.
 3. 3-inch minimum cover.
- G. Placing and Finishing Concrete:
1. Place all concrete in accordance with ACI 304R and ACI 304.2R.
 2. Do not exceed the time limits specified in Table 1001-1 of the MDOT Specifications for the time of charging the mixer to complete concrete discharge.
 3. Moisten base before placing concrete.
 4. Place concrete and consolidate, including along the faces of the forms, before finishing.
 5. Place and finish in a continuous operation.
 6. When replacing gutters along with concrete walk ramps, construct the gutter to the same dimensions and profile and use the same reinforcement pattern as the existing gutter.
 7. Float the surface just enough to produce a smooth surface free from irregularities.
 8. Round edges and joints with an approved finishing tool.

H. Joints:

1. General: Comply with ACI 318-6.3, 6.4, and ACI 301, Section 6.
 - a. Construct expansion, weakened-plane (contraction), and construction joints true-to-line with face perpendicular to the centerline, unless otherwise indicated on the Drawings.
2. Weakened-Plane (Contraction) Joints:
 - a. Provide weakened-plane (contraction) joints, sectioning concrete into areas as indicated on the Drawings.
 - b. Contraction joints for curbs shall be 1-1/2 inch deep provided at 10 foot intervals unless indicated otherwise on the Drawings.
3. Construction Joints: Place construction joints at end of placements and at locations where placement operations are stopped for a period of more than 1/2 hour, except where such placements terminate at expansion joints.
4. Install expansion joints at the end point of curves of all radius curbs.
5. Seal joints with hot-poured rubber asphalt in accordance with St. Clair County Road Commission standard details.

I. Backfilling:

1. After the concrete has gained sufficient strength, remove fixed forms and backfill with suitable material approved by the ENGINEER.
2. Compact and level the backfill 1-inch below the surface of the concrete.

3.03 CONCRETE FINISHING

- A. After striking-off and consolidating concrete, smooth surface by screening and floating. Use hand method only where mechanical floating is not possible. Adjust floating to compact surface and produce uniform texture.
- B. After floating, test surface for trueness with a 10 foot straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous smooth finish.
- C. After completion of floating and troweling when excess moisture or surface sheen has disappeared, complete surface finishing to create a non-slip finish by scoring the surface with a fine-hair broom, perpendicular to the line of traffic. Repeat operation if required to provide a fine line texture acceptable to the ENGINEER. Finish edges with 1/2-inch radius.

- D. Do not remove forms for 24-hours after concrete has been placed. After form removal, clean ends of joints and point-up any minor honeycombed areas. Remove and replace areas or sections with major defects, as directed by the ENGINEER.

3.04 CURING

- A. General:
 - 1. After texturing operations have been completed and after the free water has left the surface, coat the concrete with a uniform layer of membrane curing compound.
 - 2. Apply 1 coat of curing compound on non-grooved surfaces and 2 coats on grooved surfaces.
 - 3. Apply not less than 1 gallon per 25 square yards of concrete for each application.
 - 4. Apply the second coat after the first has dried sufficiently but do not exceed 2 hours between coats.
 - 5. Keep the compound thoroughly mixed according to the Manufacturer's recommendations.
 - 6. Do not thin curing compound.
 - 7. Reapply curing compound immediately to surfaces damaged by rain, joint sawing, foot traffic or other activities.
 - 8. If fixed forms are removed during the curing period, coat the entire area of the sides of the concrete walk with curing compound immediately after removal of forms.
- B. These requirements are minimum requirements only.
- C. Repair or replacement of concrete showing damage due to inadequate curing is required.
- D. All costs associated with this corrective work will be borne by the CONTRACTOR.

3.05 PROTECTION

- A. Protect the concrete from damage until acceptance of the Work.
- B. Protect the concrete from freezing until the concrete has attained a compressive strength of at least 1800 psi.
- C. Maintain as clean as practical by removing surface stains and spillage of materials as they occur.
- D. Sweep concrete and wash free of stains, discolorations, dirt and other foreign material just prior to final inspection.

3.06 DEFECTIVE WORK

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- A. The following list of deficiencies shall be considered defective work and shall be replaced by the CONTRACTOR at no cost to the OWNER:
 - 1. Cracks of any length that are 1/8-inch wide or wider.
 - 2. A hole that is 1/2-inch or greater in depth and 2 inches or greater in diameter.
 - 3. Residual splatter that is 1/2-inch or higher than adjacent concrete.
 - 4. Elevation difference of 1/4-inch in 10 feet caused by settling or improper forming.
 - 5. Footprints, bike tire tracks, animal tracks, or the like, created while concrete was not cured.
 - 6. Other work identified as defective by OWNER.

3.07 CLEANING

- A. For duration of work, CONTRACTOR is to maintain work area free of waste material, debris, and the like.
- B. CONTRACTOR shall provide on-site containers as necessary for work of this Section. Locate as directed by ENGINEER
- C. Upon completion and when directed by ENGINEER, CONTRACTOR shall remove all excess material, debris, and equipment.
- D. Prior to acceptance of the work, clean the pavement and related areas to remove dirt and stones.

END OF SECTION 32 16 13

SECTION 33 40 00 – STORM DRAINAGE UTILITIES

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes the furnishing and installation of a storm sewer system.

1.02 UNIT PRICE – MEASUREMENT AND PAYMENT

- A. The cost of all work under this item shall be included in the cost of the Project and no separate payment shall be made therefore unless listed in the Bid Form as a Bid Item.
- B. When listed in the Bid Form as a Bid Item:
1. Sewer (of the type, class, size, and trench detail specified):
 - a. Basis of Measurement: Foot (Ft). Measured at ground level from center to center of the appurtenances connected by the sewer pipe or end of pipe.
 - b. Basis of Payment: Furnishing all labor, equipment, and materials necessary to furnish, install, and place into service the sewer pipe or culvert, including: Pipe, pipe fittings, and all other appurtenances; connections to existing or proposed manholes and/or pipe; existing sewer line connections into proposed system; patching and plastering of manholes that have been “cut into”; excavation; disposal of surplus excavation; bulkheads; dewatering; stabilization of trench subgrade; sheeting and bracing trenches; bedding material; special bedding in unstable soil; compacted backfill (trench Detail A or B, as required by the city of Port Huron Standard Detail Drawings); plugging or capping existing utilities where required; repairing or replacing all existing utilities damaged as a result of construction operations; replacement of pavement and sidewalks (unless listed as a separate item in the Bid Form); maintenance aggregate; temporary pavement and patching; fence removal and replacement; mail box removal and replacement; landscape (ornamental trees, bushes, and shrubs) removal and replacement; sprinkler system removal and replacement; and road, curb and gutter, sidewalk, parking lot, paved spillways and driveway restoration; regrading disturbed road ditches; swale restoration; resetting culverts; restoring shoulders; final grading, seeding and cleanup; and other necessary work incidental to the construction of sewer not specifically listed.

Seventy percent of the Unit Price for sewers will be considered earned when the pipe is satisfactorily installed. An additional 20 percent of the Unit Price for sewer will be considered earned when the roadways, driveways, and drainage are restored and maintained

in a satisfactory, useable condition. The balance of the Unit Price for sewers will be considered earned after the sewer has been finally inspected and the sewer placed in service; finish grading (including final ditching of the project area) has been completed; the seeding and mulching (or sodding if specified on the drawings) has been completed; and the aggregate roadways and streets have been fully restored.

2. Manholes, Catch Basins, Inlets, Tee Manholes, Junction Chambers, or Other Storm Drainage Structures:
 - a. Basis of Measurement: Each (EA).
 - b. Basis of Payment: Furnishing all labor, equipment, and materials necessary to install the structure and appurtenance completely as detailed on the drawings, including: excavation; disposal of surplus excavation; bulkheads; dewatering; stabilization of trench subgrade; sheeting and bracing trenches; bedding material; special bedding in unstable soil; compacted backfill (to match trench Detail A or B used for the utility pipe, as required by the city of Port Huron Standard Detail Drawings); precast concrete structure; reinforcing steel; brick and/ or blocks; mortar; plastering; forms and forming reinforced concrete structures; forming and shaping of bottom fillets; sleeves; pipes; pipe fittings, connections, grates; steps; frame and cover; fittings; thrust blocks; connections; plugging or capping existing utilities where required; repairing or replacing all existing utilities damaged as a result of construction operations; replacing surface conditions; and all other incidental work not specifically listed.
3. Underdrain(of the type, class, size, and trench detail specified):
 - a. Basis of Measurement: Foot (Ft).
 - b. Basis of Payment: Furnishing all labor, equipment, and materials necessary to furnish, install, and place into service the underdrain as specified on the plans and per MDOT.
4. End Section (of the type and size specified):
 - a. Basis of Measurement: Each (EA).
 - b. Basis of Payment: Furnishing all labor, equipment, and materials necessary to furnish, install, and place into service the end section.
5. Dr Structure Cover (of the type and size specified):
 - a. Basis of Measurement: Each (EA).
 - b. Basis of Payment: Furnishing all labor, equipment, and materials necessary to furnish, install, and place into service the frame and cover.
6. Outlet Control Structure:
 - a. Basis of Measurement: Each (EA).
 - b. Basis of Payment: Furnishing all labor, equipment, and materials necessary to install and place into service the outlet control structure.

1.03 REFERENCES

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- A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
1. ASTM Standards:
 - a. A48 - Gray Iron Castings.
 - b. A536 - Ductile Iron Castings.
 - c. C14 - Concrete Sewer, Storm Drain and Culvert Pipe.
 - d. C55 - Concrete Building Brick.
 - e. C62 - Building Brick (Solid Masonry Units Made from Clay or Shale).
 - f. C76 - Reinforced Concrete Culvert, Storm Drain and Sewer Pipe.
 - g. C139 - Concrete Masonry Units for Construction of Catch Basins and Manholes.
 - h. C270 - Mortar for Unit Masonry.
 - i. C443 - Joints for Circular Concrete Sewer and Culvert Pipe Using Rubber Gaskets.
 - j. C478 - Precast Concrete Manhole Sections.
 - k. C497 - Method of Testing Concrete Pipe, Sections or Tile.
 - l. C822 - Definitions of Terms Relating to Concrete Pipe and Related Products.
 - m. C923 - Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes.
 - n. C924 - Standard Practice for Testing Concrete Sewer Lines by Low-Pressure Air Test Method.
 - o. C1103 - Standard Practice for Joint Acceptance Testing of Installed Precast Concrete Pipe Sewer Line.
 - p. D449 - Asphalt Used in Dampproofing and Waterproofing.
 - q. D520 - Zinc Dust Pigment for Paints.
 - r. D3350 - Standard Specifications for Polyethylene Plastic Pipes and Fitting Materials.
 - s. F449 - Subsurface Installation of Corrugated Thermoplastic Tubing for Agricultural Drainage or Water Table Control.
 - t. F1417 - Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air.
 2. AASHTO Standard Specifications:
 - a. M36 - Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains.
 - b. M167 - Standard Plate for Pipe, Pipe Arches, and Arches.
 - c. M190 - Bituminous Coated Corrugated Metal Culvert Pipe and Pipe Arches.
 - d. M218 - Steel Sheet, Zinc-Coated (Galvanized) for Corrugated Steel Pipe.
 - e. M274 - Steel Sheet, Aluminum-Coated (Type 2) for Corrugated Steel Pipe.
 - f. M288 - Geotextiles Used for Subsurface Drainage Purposes.
 3. MDOT Current Standards:
 - a. Specifications for Construction.

- b. Standard Plans.
- 4. St. Clair County Road Commission (SCCRC) Requirements.
- 5. The City of Port Huron Requirements.
- 6. Office of St. Clair County Public Services Commissioner.

1.04 DEFINITIONS

- A. Abbreviations:
 - 1. RCP - Reinforced concrete pipe.
 - 2. CSP - Corrugated steel pipe.
 - 3. PVC - Polyvinyl chloride.

1.05 SUBMITTALS

- A. Action Submittals: For Product Data:
 - 1. Pipe.
 - 2. Manholes.
 - 3. Catch Basins & Inlets.
 - 4. End Sections.
 - 5. Water Quality Structures.
- B. Informational Submittals: Submit Manufacturers' sworn statements that the pipe materials furnished comply with this Specification

1.06 QUALITY ASSURANCE

- A. Fabrication and Installation Personnel Qualifications:
 - 1. Trained and experienced in the fabrication and installation of the materials and equipment.
 - 2. Knowledgeable of the design and the reviewed Shop Drawings.
- B. Testing of Material Installation:
 - 1. Light or reflected light test for alignment.
 - 2. Visual inspection for leakage and workmanship.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in original, unbroken, brand marked containers or wrapping as applicable.
- B. Handle and store materials in a manner which will prevent deterioration, damage, contamination with foreign matter, damage by weather or elements, and in accordance with Manufacturer's directions.
- C. Reject damaged, deteriorated or contaminated material and immediately remove from the Site. Replace rejected materials with new materials at no additional cost to OWNER.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. RCP: Northern Concrete Pipe; or equal.
- B. CSP: Contech; St. Regis Culvert, Inc.; or equal.
- C. PVC: Contech; JM Eagle; or equal.

2.02 PIPE MATERIALS

- A. RCP:
 - 1. General: Type and class as indicated on the Drawings.
 - 2. Types:
 - a. Reinforced Concrete (RCP): ASTM C76.
 - 3. Joints:
 - a. Premium O-ring or Profile Gasket and shall conform to ASTM C-443. Lubricants by pipe Supplier.
 - b. With OWNER approval, bituminous compound joint filler material may be allowed for rear yard storm sewer (ASTM D994) provided joints are covered in geotextile fabric and the pipe is bedded in sand.
 - 1) Geotextile Fabric: Nonwoven. Width: 3 feet.
 - 2) Physical Requirements:

	Geotextile Blanket	Geotextile Blanket with MDOT Class II Backfill
Grab Tensile Strength (Minimum), Lbs.	90	
Trapezoid Tear Strength (Minimum), Lbs.	45	
Puncture Strength (Minimum), Lbs.	45	
Mullen Burst Strength (Minimum), PSI	140	100
Permittivity Per Second, Sec ⁻¹	0.5	
Apparent Opening Size (Maximum), MM	0.21	0.30 (Pavement and Foundation Underdrains) 0.60 (Other Areas)

- 3) For pipe wrap where backfill around the pipe meets MDOT granular material Class II requirements; geotextiles, including knitted polyester sock, which meet the following minimum requirements in the applied condition are permitted:
 - a) Mass/Unit Area: 3.0 oz/sq. yd.

- b) Mullen Burst Strength: 100 psi.
- c) Maximum Apparent Opening Size: 0.30 mm for pavement and foundation underdrains; and 0.60 mm in all other areas.

- 4. End Sections:
 - a. As indicated on the Drawings.
 - b. Type:
 - 1) Flared concrete end section with concrete footing.
- 5. Bar Screen: As indicated on the Drawings.

B. CSP:

- 1. General: Type, gage, and corrugations as indicated on the Drawings.
- 2. Types:
 - a. Galvanized: AASHTO M36.
 - 1) Zinc-coated Sheets: AASHTO M218.
 - b. Bituminous-coated: AASHTO M190.
- 3. Corrugations:
 - a. Pitch and Depth:
 - 1) 12-inch to 72-inch Diameter: 2-2/3-inch x 1/2-inch.
- 4. Wall Thickness:
 - a. Minimum: 0.064 inches (16 gage), unless indicated otherwise on the Drawings.
- 5. Coupling Bands:
 - a. Pipe Diameters 12 Inches to 36 Inches with Annular Corrugations or Reformed Ends:
 - 1) Corrugated band with sleeve gasket; or
 - b. Coating: Match pipes being connected.
 - c. Wall Thickness: Match pipes being connected.
 - d. Width:

Coupling Width	Pipe Diameter
7 inches	18 inches and less
12 inches	24 inches through 60 inches
24 inches	Over 60 inches

- 6. End Sections:
 - a. As indicated on the Drawings.
- 7. Bar Screen: As indicated on the Drawings.

C. PVC Pipe:

- 1. General: PVC pipe may be allowed for roof drain connections to manholes or catch basins. Type and schedule as indicated on the Drawings.
- 2. Types:
 - a. Smooth Walled:
 - 1) 4-inch to 15-inch ASTM D3034.
 - 2) 18-inch to 48-inch ASTM F679.
 - b. Ribbed ASTM F794.
- 3. Section Properties:

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- a. SDR 23.5.
 - b. Schedule 40.
 - c. Truss Pipe
4. Joints:
 - a. Push-on Type Joint.
 - b. ASTM D3212.
5. Fittings: Manufactured and furnished by the pipe Supplier.

2.03 MANHOLES, CATCH BASINS AND INLETS

- A. Type of Units:
 1. As indicated on the Drawings:
 2. Precast Reinforced Concrete:
 - a. Base Section: ASTM C478, precast or poured concrete base.
 - b. Riser and Cone Sections: ASTM C478.
 - c. Joints: Premium O-ring or Profile Gasket conforming to ASTM C443.
 3. Radial Concrete Block:
 - a. Base Slab: ASTM C478, separate base slab.
 - b. Blocks:
 - 1) ASTM C139.
 - c. Joints: Mortar: ASTM C270, Type M.
- B. Hardware:
 1. Steps:
 - a. General:
 - 1) Steps shall be placed in all catch basins more than 7 feet deep or catch basins with oil/grease separators.
 - 2) Steps shall be factory installed by M.A. Industries, PS-1 (precast manhole), PS1-B (block manhole) polypropylene, or approved equal.
 - 3) If steps are to be installed, than eccentric cones shall be installed (per ASTM C-478 for pre-cast structures)
 2. Castings: in accordance with the city of Port Huron Standard Detail Drawings.
 3. Mortar: ASTM C270, Type M.
 4. Brick:
 - a. Concrete: ASTM C55, Type I, Grade N.
 5. Grade Rings: ASTM C478.
 6. Concrete: MDOT S3.
 7. Waterproofing:
 - a. Bituminous: ASTM D449.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Alignment and Grade:
 - 1. If there is a grade discrepancy or an obstruction which is not indicated on the Drawings, notify OWNER and obtain instructions prior to proceeding.
 - 2. Where Storm Sewer Crosses Water Main:
 - a. Expose water main prior to laying storm sewer to verify existing depth.
 - b. Maintain minimum clearance of 18 inches unless otherwise indicated on the Drawings or approved by OWNER.
 - c. Space joints equidistant from crossing.
 - 3. Control:
 - a. Level and Grade Rod: Check line and grade at each structure or cleanout, and 25 foot intervals thereafter.
 - b. Laser Beam:
 - 1) Check Line and Grade At: Set-up point, 25 feet, 50 feet, 100 feet and 100-foot intervals thereafter.
 - 2) Reset laser at each manhole with a 600 feet maximum.
 - c. Allowable Deflection:
 - 1) Horizontal: 0.20 feet.
 - 2) Vertical: 0.10 feet.

3.02 INSTALLATION

- A. General:
 - 1. Install pipe, fittings and appurtenances in accordance with Manufacturer's recommendations except as herein specified or indicated on the Drawings.
 - 2. Prevent entrance of foreign material.
- B. Pipe Laying for Concrete and PVC Pipe:
 - 1. Bearing: Support entire length of pipe barrel evenly with extra excavation at joints.
 - 2. Direction: Commence at outlet and proceed up grade with spigot ends pointing in direction of flow.
 - 3. Method:
 - a. Wipe clean the socket of pipe last laid.
 - b. Center spigot end of pipe to be laid and push home against base of socket.
 - c. Center pipe to form a sewer with a uniform invert.
- C. Pipe Laying for CSP Culvert:
 - 1. Bearing: Support entire length of pipe barrel evenly with extra excavation at joints.
 - 2. Direction: Commence at outlet and precede upgrade with inside laps of circumferential joints pointing in direction of flow, and with no longitudinal joints in the lower quadrant.
 - 3. Method:
 - a. Put coupling band into position at the end of pipe last laid with band open to receive next section.

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- b. Bring next section into position within about 1-inch of section last laid.
 - c. Clean the interior of band and exterior of pipe of all dirt, stones and debris.
 - d. Center pipe to match connecting parts of both the band pipe sections.
 - e. Insert bolts and tighten.
- D. Tolerances:
 - 1. The maximum allowable deviation from grade for gravity flow pipe shall be 2 percent of the pipe diameter, but not more than 0.1 foot.
 - 2. Maximum allowable deviation from line between manholes:
 - a. 3 inches for pipe 8 to 12 inches in diameter.
 - b. 6 inches for pipe 15 to 24 inches in diameter.
 - c. 9 inches for pipe greater than 24 inches in diameter.
 - d. Maximum deflection per pipe shall be 1 inch.
- E. Jointing:
 - 1. Bituminous Compound:
 - a. Surfaces of Joint: Clean and dry before compound is applied.
 - b. Apply bituminous compound to the spigot or tongue of the pipe in sufficient quantity to completely fill the space between the pipe tongue and the mating pipe bell when the joint is pushed home.
 - c. Pipe 36 inches and larger shall have the inside of the joint pointed with mortar by removing the bituminous compound to a minimum depth of 3/4 inch and filling this space with mortar. Pipe smaller than 36 inches in diameter shall not require pointing.
 - 2. Lubricants: As required for coated CSP pipe. As required for gaskets.
 - 3. Gaskets:
 - a. Surfaces of Joint: Clean and dry before lubricant is applied.
 - b. Take care in laying that the pipe does not shift and that it remains in a home position after assembly.
 - 4. Band Connector for CSP:
 - a. Bar, Bolt, and Strap: Tighten bolts to a torque of 100 to 300 foot pounds.
 - 5. Geotextile Wrap: Wrap around joint surfaces.
 - 6. Allowable Joint Tolerance:
 - a. Maximum: 1/2-inch at newest surfaces of the joint.
 - b. Allowable joint tolerance shall not affect the lines and grades and their permissible to tolerances.
- F. Manholes:
 - 1. Base Section Placement: Full and even bearing.
 - 2. Precast Units: Mortar joints, lift holes, and around pipes.
 - 3. Block Units:
 - a. Block: Set in full bed of mortar with key slots filled.
 - b. Joints: Maximum 1/2-inch wide at inside face and wiped.
 - c. Exterior coating: 1/2-inch mortar coat outside surface.

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4. Top of Casting Elevation:
 - a. Bituminous Base Course: At base course grade.
 - b. Final Wearing Surface:
 - 1) At finished grade.
 - 2) Adjustment of castings from base course grade to finished grade is included in the cost of the manhole.
 - 3) Other Areas: As directed by the OWNER or indicated on the Drawings.
 5. Waterproofing: Prevent visible leakage.
 6. Refer to standard detail on the Drawings.
- G. Catch Basins and Inlets:
1. Base Section Placement: Full and even bearing.
 2. Precast Units: Mortar joints, lift holes and around pipes.
 3. Block Units:
 - a. Block: Set in full bed of mortar with key slots filled.
 - b. Joints: Maximum 1/2-inch below gutter grade.
 - c. Exterior coating: 1/2-inch mortar coat outside surface.
 4. Casting Elevation:
 - a. Gutter Area: 1/2-inch below gutter grade.
 - b. Other Areas: As indicated on the Drawings or directed by OWNER.
 5. Waterproofing: Prevent visible leakage.
 6. Refer to standard detail on the Drawings.
- H. Connections:
1. To Existing Structures: Relay and repoint loose blocks and bricks as required.
 2. For Future Use:
 - a. Bulkhead: With 8-inch thick brick and mortar and 1/2-inch plaster outside.

3.03 REPAIR

- A. Treatment of Field Welds and Damaged Galvanized Steel Surfaces:
1. Clean with wire brush.
 2. Two coats of zinc rich paint conforming to ASTM D520.

3.04 CLEANING

- A. Debris: Remove all dirt and debris, including cemented or wedged material from the inside of all sewers, manholes, and catch basins.
- B. Final Acceptance: Clean all sewers, manholes, and catch basins before requesting final acceptance.

3.05 TESTING AND INSPECTION

- A. Observation: By OWNER.

FIRE STATION NO. 4 BUILDING IMPROVEMENTS
PROJECT NO. P26-0010

- B. Alignment and Grade Tests:
 - 1. Visual:
 - a. Each manhole to manhole section.
 - b. Mirrors or Lights: Adequate to illuminate the section.

END OF SECTION 33 40 00



MAINTAINING TRAFFIC TYPICALS

DISTANCE BETWEEN TRAFFIC SIGNS, "D"

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

GUIDELINES FOR LENGTH OF LONGITUDINAL BUFFER SPACE, "B"

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

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

MINIMUM MERGING TAPER LENGTH, "L" (FEET)

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

NOT TO SCALE

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

FILE: 101-GEN-SPACING-CHARTS.dgn

KEY

-  TRAFFIC REGULATOR
-  CHANNELIZING DEVICES
-  LIGHTED ARROW PANEL (CAUTION MODE)
-  TRAFFIC FLOW
-  REFLECTS EXISTING SPEED LIMIT
-  PLACE SIGN AS INDICATED IN NOTE S5
-  PLACE SIGN AS INDICATED IN NOTE S2

STANDARD NOTES

(SEE GEN-NOTES)

GENERAL: G1, G2, G3, G4
SIGNING: S1, S2, S3, S4, S5
TRAF REG: TR1, TR2
DEVICES: TCD1, TCD2, TCD6

