

## **ALL TRADES SPECIFICATIONS**

WARREN WOODS PUBLIC SCHOOLS  
PROJECT NUMBER: 171755N  
DATE: MAY 26, 2020

## **PROJECT**

# **WARREN WOODS PUBLIC SCHOOLS 2017 BOND ISSUE-VARIOUS PROJECTS BID PACKAGE #13 - REBID**

## **OWNER**

Warren Woods Public Schools  
12900 Frazho Road  
Warren, MI 48088

## **ARCHITECT**

Wakely Associates, Inc.  
30500 Van Dyke Ave., Suite 209  
Warren, Michigan 48093

**SPECIFICATIONS**

PROJECT NUMBER 171755N  
APRIL 21, 2020

**PROJECT**

WARREN WOODS PUBLIC SCHOOLS  
2017 BOND ISSUE - VARIOUS PROJECTS  
BID PACKAGE #13

**OWNER**

WARREN WOODS PUBLIC SCHOOLS  
12900 FRAZHO ROAD  
WARREN, MI 48088

**ARCHITECT**

WAKELY ASSOCIATES, INC.  
30500 VAN DYKE, SUITE 209  
WARREN, MICHIGAN 48093  
586-573-4100

**ELECTRICAL**

PETER BASSO ASSOCIATES  
5145 LIVERNOIS  
SUITE 100  
TROY, MI 48098  
248-879-5666

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SECTION 00020 - INVITATION FOR BIDS

**PROJECT**

**WARREN WOODS PUBLIC SCHOOLS  
2017 BOND ISSUE RENOVATIONS  
BID PACK #13 - REBID**

**OWNER**

WARREN WOODS PUBLIC SCHOOLS  
12900 FRAZHO ROAD  
WARREN, MI 48088

**ARCHITECT**

WAKELY ASSOCIATES, INC.  
30500 VAN DYKE AVENUE SUITE 209  
WARREN, MICHIGAN 48093  
(586) 573-4100

**PROJECT DESCRIPTION:**

The project consists of removal and replacement of the existing exit signs and emergency ballasts as shown on the drawings for main corridors of various School District Buildings.

The project also includes construction of (2) two marquee signs: one (1) at the Hawthorn Administrative Center and one (1) at the Transportation Building. Project also includes demolition of an existing planter and rework of the exterior of the main entrance including new concrete and concrete benches.

**ALLOWANCE:**

Contractor shall include in Base Bid, an allowance of \$5,000.00/building to:

1. Secure any loose or remove unused tech wiring above corridor ceilings in the work scope.
2. Firestop/fireseal any existing penetrations or openings in walls requiring fire rating or smoke tightness.
3. Any unused allowance will be returned to the Owner at the end of the project.

**TYPE OF PROPOSAL:**

A single lump sum proposal is being entertained for the work of this proposal.

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DATE OF SUBMISSION:

The Owner will receive sealed proposals for the work herein set forth until **2:00 p.m. EST, on Wednesday, June 10, 2020, at Warren Woods Public Schools in the Hawthorn Administrative Services Building, 12900 Frazho Road, Warren, MI 48088.** Bids will be publicly opened shortly thereafter. Late bids will not be accepted or considered.

The bid shall be accompanied by a sworn and notarized statement disclosing any familial relationship that exists between the Owner or any employee of the bidder and any member of the School Board, or the Superintendent of Schools. The Owner will not accept a bid that does not include this sworn and notarized disclosure statement.

PROPOSAL GUARANTY:

Each proposal must be accompanied by a certified check, cashiers check, or a satisfactory Surety Bid Bond in an amount not less than five percent (5%) of the total bid price as guaranty. No bid shall be considered unless it is accompanied by the required guaranty.

Checks shall be made payable to Warren Woods Public Schools.

Such cash, checks, or bid bonds will be returned to all except the three lowest bidders for each contract within five (5) days after the opening of bids, and the remaining cash, checks, or bid bonds will be returned promptly after the Owner and the accepted bidders have executed the Contract, or if no award has been made, within sixty (60) days after the date of the opening of bids, upon demand of the bidder at any time thereafter, so long as he has not been notified of the acceptance of his bid.

PRE-BID MEETING

A Pre-Bid Meeting will be held at The Hawthorn Administrative Services Building, 12900 Frazho Road, Warren, MI 48088 **at 1:00 p.m. EST on Wednesday, June 3, 2020.** Attendance at this pre-bid meeting is not mandatory, however, absolutely no extra cost will be allowed for any item or thing which could have been seen by visiting the site(s).

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BIDDING DOCUMENTS:

Bidding documents consist of plans and specifications as prepared by Wakely Associates Inc./Architects, Warren, Michigan.

Bid documents can be purchased at the offices of ARC, 1009 W. Maple Road, Clawson, MI 48107 after noon on Tuesday, May 26, 2020.

Bidding documents will be available on or after noon on Tuesday, May 26, 2020 by calling Wakely Associates Inc. at 586-573-4100 or email at [aduda@wakelyaia.com](mailto:aduda@wakelyaia.com) for a link to access the documents.

Copies of the Bidding documents will also be on file for reference at the office of:

1. The Owner
2. CAM, Bloomfield Hills
3. McGraw Hill, Detroit
4. Reed Construction Data, Novi
5. The Architect

PROPOSAL ACCEPTANCE:

The right to accept and/or reject any and all proposals and to waive any and all informalities and/or irregularities in bid proposals submitted during the bidding process is reserved by the Owner, which right may be exercised at the sole discretion of the Owner.

PROPOSAL WITHDRAWAL:

Proposals for base bids may not be withdrawn for a period of sixty (60) days after the time established for the receipt of proposals. Bidders may withdraw at any item prior to the time set for the receipt of proposals.

END OF SECTION 00020

MAY 26, 2020

SECTION 00100 - INSTRUCTIONS TO BIDDERS

Owner will receive sealed proposals only as set forth in the Invitation to Bid and complying with all requirements as contained in Instructions to Bidders.

DOCUMENTS

Bidding documents consist of plans and specifications as prepared by Wakely Associates Inc./Architects, Warren, Michigan.

Bid documents can be purchased at the offices of ARC, 1009 W. Maple Road, Clawson, MI 48107 beginning after noon on Tuesday, May 26, 2020.

Bidding documents will be available on or after noon on Tuesday May 26, 2020 by calling Wakely Associates Inc. at 586-573-4100 or email at [aduda@wakelyaia.com](mailto:aduda@wakelyaia.com) for a link to access the documents.

Copies of the Bidding documents will also be on file for reference at the office of:

1. The Owner
2. CAM, Bloomfield Hills
3. McGraw Hill, Detroit
4. Reed Construction Data, Novi
5. The Architect

BIDDING DOCUMENTS

The Bidding Documents consist of the following:

The Drawings as enumerated in Section 00851, Index of Drawings.

The Specifications as enumerated in the Table of Contents.

All other documents as provided for in Article 1, Paragraph 1, Section 1 of the General Conditions as modified.

EXAMINATION

Each bidder shall examine the Bidding Documents and satisfy themselves about the extent of the proposed work by personal examination of the site and surroundings, and make their own estimate therefrom of the facilities and difficulties attending the performance and completion of the job.

No additional compensation will be allowed on account of conditions which could be determined by examining the Bidding Documents or the site(s).

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#### INTERPRETATION

If any person contemplating submitting a bid is in doubt as to the true meaning of any part of the Drawings, Specifications, or other Bidding Documents, they must submit to the Architect a written request for an interpretation thereof. If such an interpretation is not requested, the bids will be presumed to be based upon the interpretation and directions given by the Architect after Contract award, in accordance with provisions of the Contract.

Neither the Owner nor the Architect will be responsible for any verbal explanations or interpretations of the Bidding Documents.

Every request for such interpretation should be in writing, addressed to the Architect at his office, and to be given consideration, must be received at least ten (10) business days prior to the date fixed for the opening of bids. Any and all such interpretations, and any supplemental instructions will be in the form of written addenda to the Bidding Documents which, if issued, will be mailed to all prospective bidders (at the respective address furnished for such purposes) prior to the date fixed for the opening of bids. All addenda so issued shall become part of the Bidding Documents.

#### SUBSTITUTIONS

To obtain approval to use unspecified products, bidders shall submit written requests at least five business(5) days before the bid date. Requests received after this time will not be considered. Requests shall clearly describe the product for which approval is asked, including all data necessary to demonstrate acceptability. If the product is acceptable, the Architect will approve it in an Addendum issued to all prime bidders on record.

#### BASIS OF BID

A single lump sum proposal is being entertained for the complete work of this proposal.

Partial or segregated bids or assignments will not be considered. Include quotes for all alternates and unit prices; failure to do so may result in rejection of the proposal.

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#### PREPARATION

Proposal shall be submitted on the form bound in these specifications, Form of Proposal, in original form without erasures, interlineations or alterations.

Submit two (2) copies of proposal, retain one for your records. Oral, fax, email, or telephone proposals will not be accepted.

Proposals must be filled out in ink or typewritten in duplicate. Blank spaces in the proposals must be filled in and no changes shall be made to the phraseology of the proposal. Quotes shall be entered in verbal and numeric forms. In case of a discrepancy between the written and the numeric form, the written form shall govern.

All bids shall be signed and dated in longhand.

Bids which are not signed by the individual making them should have attached thereto a power of attorney, evidencing authority to act as agent for the person whom it is signed.

Bids which are signed for a partnership should be signed by one of the partners or by an attorney-in-fact. If signed by an attorney-in-fact, evidence of authority to sign the bids shall be attached.

Bids which are signed for a corporation should have the correct corporate name thereon and the signature of the president or other officer legally able to contract in the name of the corporations. In addition, a signed Secretary's Certificate evidencing the authority of the Officer to contract in the name of the corporation shall be included. Any proposal submitted by a corporation shall bear its seal.

#### BID SECURITY

The successful bidders securities will be retained until they have signed the Contract and furnished the required payment and performance bonds. The Owner reserves the right to retain the security of the next two lowest bidders for each contract until the lowest bidders enter into contract, or until sixty (60) days after the bid opening, whichever is the shorter. All other bid security will be returned as soon as practicable. If any bidder refuses to enter into a Contract, the Owner will retain their Bid Security as liquidated damages, but not as a penalty.

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SUBCONTRACTORS

The Owner and Architect reserve the right to require of bidders tentatively selected for consideration in the awarding of the Contract, a list of the subcontractors whom the Contractor intends to employ.

The Owner reserves the right to disapprove the use of any proposed subcontractor, and in such event, the bidder submitting such subcontractor shall submit another such subcontractor in like manner within the time specified by the Owner. The Owner reserves the right to reject any bid if such information required by the Owner is not submitted as above indicated.

SUBMITTAL

Submit proposals in sealed opaque envelopes having listed thereon the following:

**PROPOSAL: WARREN WOODS PUBLIC SCHOOLS  
2017 BOND ISSUE - VARIOUS PROJECTS.  
BID PACK #13 - REBID  
ATTN: NEIL CASSABON, DEPUTY SUPT., BUSINESS  
SERVICES**

Contractor: \_\_\_\_\_

WITHDRAWAL

Proposals for base bids may not be withdrawn for a period of sixty (60) days after the time established for the receiving of proposals. Bidders may withdraw at any time prior to the time set for the receiving of proposals.

IRREGULARITIES

The Owner reserves the right to disqualify Bids before or after opening, upon evidence of collusion with intent to defraud, or other illegal practices upon the part of the bidder.

The Owner also reserves the right to reject any or all bids in whole or in part and to waive any informalities therein.

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Any error and/or omission in the proposal form or any other irregularity as a result of negligent preparation shall not furnish cause for relief for any damages resulting therefrom, nor in any way relieve the Contractor from fulfillment of all contractual obligations as provided for in the Bidding Documents.

#### TAXES AND CONTRIBUTIONS

Proposal, unit prices, alternate prices stated include all taxes or contributions required by bidders business.

Michigan State sales tax is applicable to this work.

#### OPENING

Proposals will be publicly opened and read aloud.

#### BID BREAKDOWN CONSTRUCTION INFORMATION

Upon notice from the Architect, the low bidders shall submit a detailed cost breakdown of all work covered by the Bidding Documents. The breakdown shall show quantity of material and labor, units of material and labor, material cost, labor cost and total cost.

#### AWARD OF CONTRACT

The Contract will be awarded to the lowest responsible bids, complying with the terms of the Bidding Documents, with full consideration of alternates.

#### EXECUTION OF CONTRACT

The Owner reserves the right to accept any and all bids, or to negotiate contract terms with the various bidders when such is deemed by the Owner to be in his best interest.

END OF SECTION 00100

**NON-COLLUSION AFFIDAVIT**

County )  
 ) SS:

\_\_\_\_\_ being first duly sworn,  
deposes and says that he is the

\_\_\_\_\_  
(Individual, Partner, Corporate Officer)

making the foregoing proposals or bids; that such bids are genuine and not collusive or sham; such bidder has not colluded, conspired, connived, or agreed, directly or indirectly, with any bidder or person, to put in sham a bid, or that such other person shall refrain from bidding and has not in any manner, directly with any person, to fix the bid price of afferent or any other bidder, or to fix any overhead, profit or cost element of said bid price, or of that of any other bidder, or to secure any advantage against the Joint Purchasers or any person or persons proposal are true; and further, that such bidder has not, directly or indirectly submitted this bid, or the contents thereof, or divulged information or data relative thereto any association or to any member or to any member or agent thereof.

\_\_\_\_\_  
Sworn to and subscribed before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

\_\_\_\_\_  
Notary Public

My commission expires on \_\_\_\_\_

**BIDDER: THIS AFFIDAVIT MUST BE COMPLETED, SIGNED, NOTARIZED AND INCLUDED IN YOUR BID SUBMISSION.**

**WORK REFERENCES**

BIDDER'S COMPANY NAME \_\_\_\_\_

Please list at least three (3) companies or public agencies for which you have done similar work.

Redford Union Schools reserves the right to reject low bids for poor past performance or inadequate references.

NAME OF COMPANY

---

CONTACT PERSON

---

ADDRESS

---

TELEPHONE NO.

---

NAME OF COMPANY

---

CONTACT PERSON

---

ADDRESS

---

TELEPHONE NO.

---

NAME OF COMPANY

---

CONTACT PERSON

---

ADDRESS

---

TELEPHONE NO.

---

NAME OF COMPANY

---

CONTACT PERSON

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ADDRESS

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TELEPHONE NO.

---

NAME OF COMPANY

---

CONTACT PERSON

---

ADDRESS

---

TELEPHONE NO.

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SECTION 00311 - PROPOSAL FORM/ALL TRADES

---

Name of Contractor

---

Address, City, Zip

---

Phone # / Fax #

---

Email Address

**PROJECT**

**WARREN WOODS PUBLIC SCHOOLS  
2017 BOND ISSUE RENOVATIONS  
BID PACK #13 - REBID**

**OWNER**

WARREN WOODS PUBLIC SCHOOLS  
12900 FRAZHO ROAD  
WARREN, MI 48088

**ARCHITECT**

WAKELY ASSOCIATES, INC.  
30500 VAN DYKE AVENUE - SUITE 209  
WARREN, MI 48093

**BASE PROPOSAL**

Pursuant to and in compliance with the Invitation to Bid and the Instructions to Bidders, and having carefully examined the Bidding Documents and all Addenda, the undersigned agrees to enter into an agreement with the Owner to complete the work in accordance with the said Bidding Documents for the sum of:

---

(Sum to be written out)

Dollars \$ \_\_\_\_\_

Cost of bond (if bid is less than \$50,000: if bid is \$50,000 or higher, bond cost is to be included in bid)

Dollars \$ \_\_\_\_\_

The undersigned acknowledges he/she has included the sum of twenty thousand dollars (\$20,000.00) in the Base Bid for use of an allowance for above ceiling technology work and/or above ceiling firesafing/firestopping of existing corridor walls for fire rating or smoke tightness.

VOLUNTARY ALTERNATES

The following voluntary alternates are offered by the bidder. The undersigned agrees that the amounts indicated below shall be added to or deducted from the Base Bid, as the case may be, for each alternate which is accepted.

<u>Description of Voluntary Alternates</u>	<u>Add</u>	<u>Deduct</u>
1. _____	_____	_____
2. _____	_____	_____
3. _____	_____	_____
4. _____	_____	_____

PRICE GUARANTEE

The undersigned proposes that the price stated in this Proposal is guaranteed for sixty (60) consecutive days from bid date.

TAXES

The undersigned acknowledges that the price stated above includes all taxes of whatever character or description.

SUPPLEMENTAL FEES

For additional work performed upon instruction of the Owner by subcontractors of the undersigned, add to the subcontractor's prices for such additional work a fee of \_\_\_\_\_% which includes all the charges of the undersigned for overhead and profit.

Any additional work performed upon instructions of the Owner by persons other than the subcontractors of the undersigned, the charges will be actual cost of all labor and materials (less all discounts) plus the fee of \_\_\_\_\_% which includes all the charges of the undersigned for overhead and profit and to which shall be added the actual cost of insurance and taxes.

Each proposal covering extra work shall be accompanied with complete itemized material and labor breakdowns.

For all revisions involving the deletion of contract work, it is agreed that full credit shall be given the Owner for such work deleted, including overhead and profit as quoted hereinbefore.

TIME OF COMPLETION

The undersigned agrees to commence work operations immediately upon the last day of School (June 12, 2020), with substantial completion of the work by August 15, 2020, and that the proposed bid is in full consideration of this.

ADDENDA

If any addenda or bulletins covering changes to the Bidding Documents have been received during the bidding period, the bidder shall fill in their numbers and dates which acknowledges having received same, and having included in this Proposal the work involved:

\_\_\_\_\_ Dated \_\_\_\_\_

\_\_\_\_\_ Dated \_\_\_\_\_

\_\_\_\_\_ Dated \_\_\_\_\_

BID SECURITY

A bid bond executed by a U.S. Treasury Listed Surety Company acceptable to Redford Union Schools or a cashier's check in the amount of at least 5% of the sum of the proposal payable to Redford Union Schools shall be submitted with each proposal in excess of \$24,459. All proposals shall be firm for a period of sixty (60) days.

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#### PERFORMANCE AND LABOR BOND

Successful bidders whose proposals are \$50,000 or more will be required to furnish a U.S. Treasury Listed Company Performance and Payment Bond in the amount of 100% of their bid. The cost of the Bond shall be included in each proposal.

Bidders are to indicate cost of bond on the Bid Form if total bid is less than \$50,000. Owner will make a decision if bond is required on all bids less than \$50,000.

The Board of Education reserves the right to reject any and/or all bids in whole or in part and to waive any informality therein. The Board of Education reserves the right to accept that bid which in its opinion, is in the best interest of the Owner.

#### FAMILIAL DISCLOSURE

Bidder has included Section 00401 Familial Disclosure Form (bid will not be read without this form)

#### NEGOTIATION

The undersigned agrees that, should the overall cost exceed the funds available, he will be willing to negotiate with the Owner and Architect for the purpose of making further reductions in the Contract work, and shall agree to give full credit for all such reductions in the work requested by the Owner, including full value of labor, materials, and subcontract work and reasonable proportionate reductions in overhead and profit, thereby arriving at an agreed upon Contract price.

CONTRACT EXECUTION

The undersigned agrees to execute a Contract for work covered by this Proposal, provided that he be notified of its acceptance within sixty (60) days after the opening of bids.

The undersigned hereby declares that he has the legal status checked below:

( ) Individual

( ) Partnership having the following partners:

---

---

---

( ) Corporation incorporated under the State laws of:

---

This proposal is submitted in the name of, and notice of acceptance should be mailed, faxed, or delivered to:

Date:  

---

Firm's Name:  

---

Phone No. ( ) 

---

By:  

---

  
(Signature)

In the presence of:  

---

Title:  

---

END OF SECTION 00311





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SECTION 00710 - GENERAL CONDITIONS

DOCUMENTS:

"The General Conditions of the Contract for the Construction"  
A.I.A. Documents A-201, 2017 Edition, Forms a part of these  
Specifications and shall have the same effect as if bound herein.

This Document is modified as described in Modifications of the  
General Conditions.

Contractors shall be held responsible for having familiarized  
themselves with this Document and all other documents affecting  
their contracts in this Specification.

END OF SECTION 00710

**SECTION 00810 - MODIFICATIONS OF THE GENERAL CONDITIONS**

Where any Article of the American Institute of Architects General Conditions, (AIA Document A201, 2017 Edition) is supplemented by the following provisions of such Article shall remain in effect and all supplementary provisions shall be considered as added thereto. Where any such article is modified, superseded or deleted herein, provisions of such articles not so specifically modified, superseded or deleted shall remain in effect.

Article 1 - General Provisions

1.1.1 The Contract Documents. Modification: first sentence:  
"The Contract Documents consist of the entire Bidding Documents package and the Agreement...."

Deletion: last sentence.

Addition: new text as follows (sub-subparagraph to 1.1.1):

1.1.1.1 As used in the Contract Documents, the following terms are defined as indicated below:

OWNER - as defined in Advertisement or Invitation to Bid. ARCHITECT/ENGINEER - the firm of Wakely Associates Inc.

CONTRACTOR - the person or entity so named in the Agreement who shall be known as the "prime contractor" in addition to references in Article 3.

SUPPLIER - such person or entity that supplies materials or the work to the Contractor or to a subcontractor but performs no work at the site.

N.I.C. - not in contract, work not included in this Contract.

OCCURRENCE: is defined as follows for purposes of insurance. An event which occurs during the policy period, or a continuous or repeated exposure to condition(s) which result, during the policy period, in bodily injury, sickness, or disease, or injury to, or destruction of property, of one or more persons or organizations, including the loss of use thereof, resulting from a common cause, or from exposure to

substantially the same general condition existing at, or emanating from each location shall be deemed to result from one occurrence.

Addition: new text as follows (sub-subparagraph to 1.1.3):

1.1.3.1 The Contractor is responsible for coordinating and allocating the work of all trades on the project at the time of bidding as well as during the Construction in regards to the providing of labor and materials, and performance of all cutting, coring, patching and repair work necessary to complete the project as required by the various trades including the proper allocation of work to the proper trade as claimed by the trade unions having jurisdiction over such work. Whether the Contractor's own forces perform such work or he allocates it to various subcontractors or trades, the contractor is responsible for such work and the complete project.

1.1.3.2 The Contractor shall interface all Contract work with no duplication of cost incurred due to the allocation of same work to more than one trade, and with no omissions of costs of any work due to such work not being properly assigned or allocated to a specific subcontractor, trade or the Contractor.

Addition: new paragraphs as follows:

1.2.4 The Drawings show the general arrangement, design and extent of the Work and are partially diagrammatic. The Drawings shall not be scaled for rough-in measurements, nor serve as Shop Drawings.

1.2.5 RELATION OF SPECIFICATIONS AND DRAWINGS:

- 1 To be equal authority and priority. Should they disagree in themselves, or with each other, bids shall be based on the most expensive combination of quality and quantity of work indicated. The appropriate Work, in the event of the above mentioned disagreements, shall be determined by the Architect.
- 2 Figures take precedence over scale measurements.

- 3 Large scale details take precedence over smaller scale details.
  - 4 Architectural Drawings take precedence in regard to dimensions, when in conflict with Mechanical and Structural Drawings, except for the size of the structural members.
  - 5 Specifically titled drawings and sections of the specifications take precedence over indication of the item in a collateral way.
  - 6 Existing conditions take precedence over Drawings and Specifications for dimensions.
  - 7 When multiple requirements are given for any item, all requirements shall be met.
- 1.2.6 CODE, LAWS, ORDINANCES, RULES, and REGULATIONS: Requirements of public authorities apply as minimum requirements only. They do not supersede more stringent requirements given elsewhere in the Contract Documents. If changes must be made to the Contract because of public authorities, appropriate adjustments will be made in the Contract Sum.
- 1.2.7 ENUMERATION OF ITEMS: Lists of "Work Included", "Scope" or "Description of Work" are not intended to enumerate each and every item of work or appurtenance required, and must be used in conjunction with other portions of the Contract Documents.
- 1.2.8 SPECIFIED MATERIALS, PRODUCTS, BRANDS, and PROCESSES: When multiple requirements are given for an item complies with all.
- 1.2.9 REFERENCE NOTES: Terms such as "as shown", "as indicated", "as noted" mean there are additional requirements given elsewhere in the Contract Documents. Comply with all requirements.
- 1.2.10 ABBREVIATIONS AND NAMES: Acronyms or abbreviations as referenced in contract documents and listed on the General Abbreviations and Symbols Sheet G-1 are defined to mean the associated names. Acronyms or abbreviations are subject to change, and believed to be, but not assured to be, accurate and up-to-date as of date of contract documents.

- 1.2.11 DRAWING SYMBOLS AND STANDARDS: Except as otherwise indicated, graphic symbols and standards used on drawings are those symbols recognized in the construction industry for purposes indicated.
- 1.2.12 M/E DRAWINGS: Graphic symbols used on Mechanical/Electrical drawings are generally aligned with symbols recommended by ASHRAE, supplemented by more specific symbols where appropriate as recommended by other recognized technical associations including ASME, ASPE, IEEE and similar organizations. Refer instances of uncertainty to Architect for clarification before proceeding.
- 1.2.13 STANDARD REFERENCES: Any materials, equipment or workmanship specified by references to number, symbol, or title of any specific Federal, ASTM, Industry, Association or Government Agency Standard Specifications shall comply with all applicable provisions of such standard specifications, except as limited to type, class or grade, or modified in contract documents. Reference to "Standards" referred to in the contract documents, except as modified, shall have full force and effect as though printed in detail in specifications.
- 1.2.14 PUBLICATION DATES, except as otherwise indicated, where compliance with an industry standard, ASTM, association standard, or Federal Standard, shall meet the standard in effect as of date of Contract Documents.
- 1.2.15 ACCEPTABLE MANUFACTURERS where used in the Project Manual shall mean that the listed products and manufacturers shall meet specified and indicated requirements.

Article 2 - Owner

Addition: new text as follows (sub-subparagraph to 2.2.1):

- 2.2.1.1 "The Owner shall establish site property lines by staking or other means, shall establish a permanent bench mark, and provide copies of soil boring logs and soil report, if any, for the Contractor's convenience and information. None of the data therein relating to

sub-surface soil and water conditions; size, elevation and location of existing underground services; existing underground obstructions or structures; etc., are guaranteed as being accurate or uniformly representative of actual conditions. The Owner assumes no responsibility for deductions, interpretations or conclusions drawn there from by the Contractor."

Article 3 - Contractor

- 3.4.2.1 Should the Contractor desire after the Contract Award, to substitute for the benefit of the Owner another article, material or item of equipment for one or more specified by name, he shall make a request for such substitution in writing, to the Architect stating the benefit to the Owner and the credit or extra involved and he shall provide all required supporting data and samples. If such request is rejected, the Contractor shall perform the work in accordance with the Contract Documents. Such requests shall be submitted so as to allow a reasonable time for their consideration and shall not be justification for delay of the work.
- 3.4.2.2 If a substitution requires changes in the work or other trades or Contractors, or redesign or other substantial changes in the Contract Documents, the Contractor proposing the substitution shall pay any additional costs thereby incurred.
- 3.4.2.3 After Contract Award, no substitution of any material listed in the Contract Documents or Proposal will be permitted if the request is based on delivery dates, test requirements, or other causes, unless the Bidder proves that the original material was ordered or scheduled for tests within 30 days after the contract was let and due to unforeseen circumstances cannot be delivered at the promised time or tested in accordance with the specifications without materially delaying work.

- 3.4.2.4 by making requests for substitutions based on Clause 3.4.2.1 above, the Contractor:
- (a) represents that the Contractor has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified;
  - (b) represents that the Contractor will provide the same warranty for the substitution that the Contractor would for that specified;
  - (c) certifies that the cost data presented is complete and includes all related costs under this Contract but excludes costs under separate contracts, and excludes the Architect's redesign costs, and waives all claims for additional costs related to the substitution which subsequently became apparent; and
  - (d) Will coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.
- 3.4.2.5 Proofs of conformance, as hereinafter defined, will constitute satisfactory evidence as to the kind, quality and performance values of the respective products for which such proofs are required by the Specifications. Neither delivery nor installation of the respective products shall be made until written acceptance by the Architect of the submitted proof of conformance is received by the Contractor, unless Architect gives written instruction to the contrary.
- 3.4.2.6 Affidavit - An affidavit is a notarized statement on the letterhead of the manufacturer and signed by a responsible agent of the manufacturer, certifying that the product is in conformance with the requirements of the specified regulatory agency or reference standard or performance values, as applicable; in the case of the latter, the performance values shall be listed. Each Affidavit shall be identified by name of Project, Architect's Project number, name of product, and Specification section, page and paragraphs for which the product is proposed.

- 3.4.2.7 Testing Laboratory Certificate - A Testing Laboratory Certificate is a notarized test report from a laboratory, bureau or agency acceptable to the Architect, signed by a responsible agency of that facility, certifying that the designated product has been tested within one year of the date of submittal, unless otherwise specified, and is in conformance with the reference standard of performance requirements specified, and listing the results of all tests required. The testing laboratory certificate shall accompany an Affidavit as defined in clause 3.4.2.6.

Addition: new text as follows:

- 3.4.4 Materials supplied shall conform to industry and manufacturer's standards specified, in effect on the date of issuance of the specifications. Materials shall generally be shipped, received, stored, installed and protected in accordance with printed manufacturer's instructions as modified by the detailed provisions of the specifications. Copies of the printed manufacturer's or industry standards shall be maintained on file by the Contractor at his field office.
- 3.4.5 Not later than 72 hours from the Contract Date or letter of intent to award contract, the Contractor shall provide a list showing the name of the manufacturer proposed to be used for each of the products identified in the General Requirements of the Specifications (Division 1) and, where applicable, the name of the installing Subcontractor.
- 3.4.6 The Architect will promptly reply in writing to the Contractor stating whether the Owner or the Architect, after due investigation, has reasonable objection to any such proposal. If adequate data on any proposed manufacturer or installer is not available, the Architect may state that action will be deferred until the Contractor provides further data. Failure of the Owner or Architect to reply promptly shall constitute notice of no reasonable objection. Failure to object to a manufacturer shall not constitute a waiver of any of the requirements of the Contract Documents, and all

products furnished by the listed manufacturer must conform to such requirements.

Addition: new paragraphs as follows:

- 3.9.4 The Contractors superintendent or his authorized representative shall remain in attendance at the project site and shall be present at all times when work of any kind is in progress, including overtime work.
- 3.13.1 Modification: Insert "the directions of the owner" into the paragraph to read in part as follows: "The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits, the directions of the owner and the contract documents..."

Addition: new text as follows:

- 3.14.1.1 Unless specified otherwise, Work specified in each section of the specifications includes cutting, fitting, and patching for that trade section, including that required to accommodate the work of other trades.

Addition: new text as follows (paragraph to 3.15.1):

- 3.15.1.1 "The Contractor, each Subcontractor and all separate Contractors shall at all times keep the project free from their surplus and waste materials, and bulk rubbish and debris; combustible materials shall be removed daily or more often as may be required, non-combustible materials at least once a week. Such materials shall not be allowed to accumulate or disperse around the neighborhood. Further the Contractor is responsible for:
1. Positive implementation of the "General Safety Rules and Regulations for the Construction Industry", "State Construction Safety Commission, and appropriate City Ordinances as regards the scope of this paragraph.
  2. Maintenance of the site and premises in an orderly and clean condition at all times.

3. Keeping all sidewalks, pavements, parking areas, floors and roofs free from any accumulations of snow, ice, dirt, rubbish and general refuse prior to "closing-in" of the building.
4. Broom clean (exclusive of removal of bulk debris described above) floors in all interior spaces where work is in progress after the project has been "closed-in", with the participation and cooperation of all Subcontractors and separate Contractors employed on the work.
5. Final cleaning of the entire building, including all interior finish materials, as specified in detail under Section 01700, Contract Closeout.

Addition: new text as follows (sub-subparagraph to 4.2.3):

- 4.2.3.1 The Architects presence does not imply concurrence or approval of the work. The Contractor shall call specific things to the Architect's attention if he wishes to know the Architects opinion.

Addition: new text as follows (sub-paragraph to 5.2.1):

- 5.2.1.1 The Contractor shall have primary responsibility for obtaining bids and preparing and awarding Subcontracts for all portions of the Work (except General Condition Items).

- 5.4.1 Deletion: sub-paragraph & sub-subparagraphs in its entirety

Addition: new text as follows:

- 5.4.1 Unless the Owner elects otherwise, all Subcontracts shall be between the Contractor and the appropriate Subcontractor, and shall provide that the Subcontractor consents to the assignment of the Subcontract to the Owner pursuant to Section 5.3.4 hereof, and agrees in the event such assignment becomes effective, to recognize the Owner as successor to the Contractor and to complete the Work under the Subcontract.

- 5.4.2 The Contractor shall cause all Subcontractors, laborers and vendors to agree to indemnify the Owner and hold it harmless from all claims for property damage and bodily injury that may arise from such Subcontractor's operations. Such provisions shall be in a form reasonably satisfactory to Owner.
- 5.4.3 The agreement between Contractor and the Subcontractors (and, where appropriate, between Subcontractors and Sub-Subcontractors) shall contain provisions that:
- 5.4.3.1 Preserve and protect the right of the owner and the Architect under this Agreement with respect to the Work to be performed under the Subcontract so that the subcontracting thereof will not prejudice such rights;
- 5.4.3.2 Require that such Work be performed in accordance with the requirements of these Contract Documents;
- 5.4.3.3 Require submission to Contractor of applications for payment under each Subcontract and Sub-Subcontract, in reasonable time to enable Contractor to apply for payment in accordance with General Conditions of the Construction Contract, all such applications to be in a form that fully complies with all requirements of the Michigan Construction Lien Act, the Michigan Builder's Trust Fund Act, any other requirements of law, the requirements of any financing agency and any requirements of Owner and Owner's title insurer to demonstrate the foregoing;
- 5.4.3.4 Require that all claims for additional costs or extension of time with respect to subcontracted portions of the Work shall be submitted to Contractor (via any Subcontractor or Sub-Subcontractor where appropriate) in sufficient time so that Contractor may comply in the manner provided, if any, in this Agreement for a like claim by Contractor upon the Owner;

- 5.4.3.5 Waive all rights the contracting parties may have against one another for damages caused by fire or other perils covered by the property insurance described in General Conditions hereof;
- 5.4.4 Contractor hereby assigns to Owner, as security for Contractor's performance hereunder, all Subcontracts and all other contracts and agreements entered into in connection with the Project, and appoints Owner is attorney to enforce said contracts according to their terms. Such assignment shall be operative only in the event of default by, or termination of, Contractor under this Agreement.
- 7.3.3 Modification: change paragraph number to 7.3.3  
Addition: insert new item after 7.3.3.4 as follows: ".5 cost to be determined based on estimated cost of materials, equipment and labor for the work, plus the percentage thereof stated in the Contract Documents for supervision, overhead and profit."

Addition: new text as follows:

- 8.3.4 Should the progress of the Work or of the Project be delayed by any fault or neglect or act or failure to act of the Contractor or any of Contractor's agents, employees, or anyone for whose acts any of them may be liable, so as to cause additional cost, expense, liability or damage to the Owner or damages or additional costs or expenses for which the Owner may or shall become liable, the Contractor shall and does hereby agree to compensate the Owner for and indemnify him against such costs, expenses, damages and liability.

Addition: new paragraph as follows:

- 9.3.1 Modification: change existing text to read as follows:  
"At least 20 days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment for operations completed in accordance with the schedule of values. The Contractor shall be responsible to ensure

that Application for Payment is complete, including notarized signature. A Sworn Statement from Contractor and partial waivers of lien from Subcontractors and major materials Suppliers shall also accompany each payment request, to confirm and acknowledge disbursement of the preceding payment. The Sworn Statement shall be a record attesting to the fact that sub-constructors suppliers, materials, etc. have been paid or paid for, when considering materials, from the time of the last application for payment by the Contractor. Partial waivers of lien shall be properly completed and shall list the cumulative amounts of payments received by the date of the waiver. This requirement shall not be waived unless agreed upon in writing by both the Surety and Owner."

Addition: new text as follows (sub-subparagraph to 11.2)

11.2.1.1 The insurance required by sub-paragraph 11.2.1 shall be written and maintained without interruption from date of commencement of the work until date of final payment and termination of any coverage required to be maintained after final payment for not less than the following (or greater if required by law):

1. Workers' Compensation

- |   |               |
|---|---------------|
| (a) State: Michigan   | Statutory     |
| (b) Applicable Federal<br>(e.g., Longshoremen,<br>harbor work, Work at<br>or outside U.S.<br>Boundaries): | Statutory     |
| (c) Employer's Liability:   | \$1,000,000   |
| (d) Benefits Required by<br>Union labor Contracts:  | As applicable |

2. Comprehensive General Liability (Including Premises-Operations; Independent Contractors' Protective; Products and Completed Operations; Broad Form Property Damage):
- (a) Bodily Injury:
    - \$1,000,000 Each Occurrence
    - \$1,000,000 Aggregate, Products & Completed Operations
  - (b) Property Damage:
    - \$1,000,000 Each Occurrence
    - \$1,000,000 Aggregate
  - (c) Products and Completed Operations Insurance shall be maintained for a minimum period of 1 year after final payment and Contractor shall continue to provide evidence of such coverage to Owner on an annual basis during the aforementioned period.
  - (d) Property Damage Liability Insurance shall include coverage for the following hazards:
    - X (Explosion)
    - C (Collapse)
    - U (Underground)
  - (e) Contractual Liability (Hold Harmless Coverage):
    - (1) Bodily Injury:
      - \$1,000,000 Each Occurrence
    - (2) Property Damage:
      - \$1,000,000 Each Occurrence
      - \$1,000,000 Aggregate
  - (f) Personal Injury, with Employment Exclusion deleted:
    - \$1,000,000 Aggregate

3. Comprehensive Automobile Liability (owned, non-owned, and hired):
- (a) Bodily Injury:
    - \$1,000,000 Each Person
    - \$1,000,000 Each Accident
  - (b) Property Damage:
    - \$1,000,000 Each Occurrence

NOTE: The State of Michigan has a no-fault insurance requirement. The Contractor shall be certain coverage is provided which conforms to any specific stipulation in the law.

- 11.2.2.2 Contractor shall procure and maintain builders risk insurance (Fire and Extended Coverage) on 100% completed value basis including the value of all materials furnished by parties other than the Contractors for installation in the project to cover all project structures and materials, supplies, equipment and fixtures including the installation cost thereof which are owned by the insured or for which the insured is legally liable. This policy is to have a zero (0) deductible for any and all claims made.

This policy will cover the property of insured a) while in transit at the risk of the insured, b) while on the construction site or awaiting installation, c) during construction installation or testing. This policy shall insure against all risk of direct physical damage or loss to the property insured hereunder and shall specially cover loss due to fire, wind, flood, collapse, extended coverage, vandalism and malicious mischief.

The Owner and Architect/Engineer and their consultants for this project shall be named on the policy as being also insured.

11.2.2.3 Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance:

(a) The Contractor shall either:

- (1) Require each of his subcontractors to procure and to maintain during the life of his subcontract, Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance of the type and in the amounts specified for the Contractor herein, or
- (2) Insure the activities of his subcontractors in his policy as specified herein.

Umbrella Excess Liability:

- (a) Umbrella Excess Liability must be supplied in an amount not less than \$2,000,000 and be made to cover at least all risks described in the Comprehensive General Liability and Comprehensive Motor Vehicle Liability policies.

11.2 Change: Where Owner is indicated change to Contractor

11.2.1 Modification: change the text to read as follows: "The Contractor shall obtain, maintain in force, and pay all cost incurred for, public liability insurance to protect the Owner & Architect/Engineer and their consultants for this project from claims which may arise from operations under the Contract. This policy is to have a zero (0) deductible for any and all claims made and name Owner and Architect/Engineer and their consultants as insured parties hereunder. Certificates of this insurance must be filed with the Owner and the Architect/Engineer prior to commencing work and remain in force for the full duration of the project.

11.2.1 Modification: delete phrase "Unless otherwise provided, the Owner..." in the first sentence and substitute, "The Contractor..."

- 11.2.1 Modification: change text of last part of first sentence after the phrase, "...at the site on a replacement cost basis..." to following text, "...with a zero deductible for any and all claims made."
- 11.2.1 Modification: change text of last sentence to read as follows: "This insurance shall name, in addition to the contractor, subcontractors and sub-subcontractors, the Owner and Architect/Engineer and their consultants as insured parties hereunder."
- 11.2.1 Addition: After last sentence insert the following: "The form of policy for this coverage shall be Completed Value. If the Owner is damaged by the failure of the Contractor to maintain such insurance, then the Contractor shall bear all reasonable costs properly attributable thereto."
- 11.2.2 Deletion: omit entire sub-subparagraph.
- 11.2.3 Change: Owner to Contractor and Contractor to Owner respectively where occurring in the original text
- 11.4 Addition: to end of last sentence insert the following: "...unless through gross negligence of contractor."
- 11.5.1 Revise Owner to Contactor and Contractor to Owner. Revise last paragraph to read; The Contractor shall pay the Architect and Owner their just shares of insurance proceeds received by the Contractor and by appropriate agreements the Architect and Owner shall make payments to their consultants and Contractor shall pay their own consultants in a similar manner.
- 11.1.2.1 Addition: "The Contractor shall furnish bonds covering faithful performance of the Contract and payment of obligations arising hereunder. Bonds may be obtained through the Contractors usual source and the cost thereof shall be included in the Contract Sum. The amount of each bond shall be equal to 100% of the total contract sum."

Addition: new text as follows (sub-subparagraph to 11.2.1):

11.1.2.2 The Contractor shall deliver the required bonds to the Owner not later than three days following the date the Agreement is entered into, or if the Work is to be commenced prior thereto in response to a letter of intent, the Contractor shall, prior to the commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished.

Addition: new text as follows (sub-subparagraph to 11.1.2):

11.1.2.3 The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

12.2.1 Addition: insert new text before first sentence: The Contractor, as a condition precedent to final payment, shall execute a guarantee in writing, warranting all products provided by him or for which he may be required to accept responsibility in accordance with the terms of the Contract Documents, to be and to remain without defect and in accordance with the Contract Documents.

12.2.2.1 Modification: in fifth line, after the words "shall correct it promptly", insert the words: "...commencing corrective action within seven days..."

Addition: new text as follows (sub-subparagraph to 12.2.2.1):

12.2.2.1 Where special guarantee is specified, the Contractor, as a condition precedent to final payment, shall submit to the Architect the guarantee in triplicate on 8-1/2-inch by 11-inch paper in the following form:

Wakely Project Number \_\_\_\_\_

Contractor's Job Number \_\_\_\_\_

Date \_\_\_\_\_

Guaranteed Work \_\_\_\_\_

\_\_\_\_\_

MAY 26, 2020

Specification Section Number  
Reference \_\_\_\_\_

Specification Page and  
Paragraphs Describing  
Guarantee \_\_\_\_\_

Length of Guarantee (Years) \_\_\_\_\_

Contractor \_\_\_\_\_  
Subcontractor \_\_\_\_\_

The Undersigned herewith warrant that the Work to which this guarantee applies has been executed in conformance with the requirements of the Contract Documents, and guarantee the Work to perform as specified without failure for the stated period of time after Substantial Completion or as otherwise agreed to by the Owner.

This guarantee does not apply to failure or to failure to perform due to abuse or neglect by the Owner, or his successor in interest, or damage by vandalism.

SUBCONTRACTOR -

Signed \_\_\_\_\_

Title \_\_\_\_\_

Notary \_\_\_\_\_

Date \_\_\_\_\_

CONTRACTOR -

Signed \_\_\_\_\_

Title \_\_\_\_\_

Notary \_\_\_\_\_

Date \_\_\_\_\_

12.2.2.2 Responsibility for the securing, verifying, recording, transmitting to the Architect, and all other actions, regarding the specified special guarantees rests with the Contractor. The Architect will not accept transmittals of guarantees from parties other than the Contractor.

Addition: new text as follow (sub-subparagraph to 12.2.3):

12.2.3.1 Limits of non-conforming Work: When any such Work is found, the entire area of work involved shall be corrected unless the Contractor can completely define the limits. Additional testing, sampling, or inspecting needed to define non-conforming work shall be at the contractor's expense. They shall employ the Owner's independent testing laboratory, or a mutually satisfactory independent testing laboratory, if such services are required. All corrected work shall be re-tested at the Contractor's expense.

Addition: new text as follows: (sub-subparagraph to 12.2.4):

12.2.4.1 Restriction of Supplier's Identification: In areas generally accessible to the public. Omit all supplier's name plates and identification symbols from visible products.

14.2.1 Addition: new text as follows, sub-subparagraph after last item listed: ".5 should cause or give cause for legal proceeding seeking to have himself adjudged a bankrupt, or should the Contractor become insolvent, or if the contractor is adjudged a bankrupt, or if he makes a general assignment for the benefit of his creditors."

Addition: new article as follows:

Article 16

Equal Opportunity

16.1 The Contractor shall maintain policies of employment as follows:

16.1.1 The Contractor and all Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin or age. The Contractor shall take affirmative action to insure that applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex, national origin or age. Such action shall include, but not be limited to the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of non-discrimination.

16.1.2 The Contractor and all Subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf; state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex, national origin or age. Addition: new article as follows:

Article 17

Special Conditions

17.1 Michigan Construction Lien Statute

17.1.1 Contractor must record the notice of commencement, on behalf of the Owner, with the Register of Deeds and shall post the notice in a conspicuous place on the site.

Addition: new article as follows:

Article 18

Abbreviations

18.1 Abbreviations

18.1.1 When the following abbreviations and symbols are used in the Contract Documents, or Subcontract documents, they shall have the meaning shown. Many of the abbreviations used throughout the Subcontract documents refer to associations, institutes, societies and other public bodies who publish standards which are readily available to the public. Whenever the initials representing such a body are shown, followed by a number or a combination of numbers and letters, they refer to a particular standard to which the Subcontractor shall conform. The number or combination of numerals and letters, following the abbreviation designates the standard. In all such cases, the Subcontractor shall conform to the edition or issue of the standard which is current at the Subcontract date, as revised or amended to the Subcontract date.

18.1.2 Abbreviations and Meanings for Organizations.

AIA	American Institute of Architects
AASHO	American Association of State Highway Officials
ACI	American Concrete Institute
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
ASA	American Standard Association
ASH & AE	American Society of Heating & Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWI	American Woodwork Institute
AWSC	American Welding Society Code
CSI	Construction Specification Institute
FS	Federal Specifications
NAFM	National Association of Fan Manufacturers
NBFU	National Board of Fire Underwriters
NBS	National Bureau of Standards
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association

UL Underwriters Laboratories  
USDC U.S. Department of Commerce

18.1.3 Abbreviations and Meanings for Construction Terms.

ad	access door	oc	on center
b	bottom layer reinf. concrete	od	outside diameter
brg	bearing	part	partition
brkt	bracket	pol	polished
cl	centerline	po	polyethylene
ci	cast iron	pl	plate
cc	center to center	psi	pounds per sq. in.
conc	concrete	psf	pounds per sq. foot
cont	continuous	rec	recessed
csk	countersunk	reinf	reinforced
crs	courses	rh	right hand
dh	double hung	rhr	right hand reverse
div	division	rm	room
dpc	dampproof course	rs	roof sump
dwg	drawing	rwc	rain water conductor
ef	exhaust fan	rwl	rain water leader
elev	elevation	s.f.	square foot
ewc	electric water cooler	ss	stainless steel
exist	existing	std	standard
fin	finished, finishing	t&f	tongue and groove
ftg	footing	terr	terrazzo
fd	floor drain	typ	typical
flr/fl	floor	u/s	underside
ga	gauge	ul	upper layer reinf. concrete
gi	galvanized iron	vct	vinyl composition
gs	galvanized sheet		tile
gsg	galvanized sheet gauge	vb	vapor barrier
hor	horizontal	vert	vertical
ins	inches	wc	water closet
id	inside diameter	wt	weight
ksf	kips per square foot	wd	wood
lav	lavatory		
lh	left hand		
lhr	left hand reverse	E-W	East to West in reinf. concrete
lpc	laminated plastic covering	N-S	North to South in

WARREN WOODS PUBLIC SCHOOLS  
2017 BOND ISSUE-VARIOUS PROJECTS  
BID PACK #13 - REBID 171755N

MAY 26, 2020

mk	master keyed		reinf. concrete
max	maximum	O/	diameter
met	metal	'	foot, feet
min	minimum		
mfgr	manufacturer	"	inch, inches
ms	manufacturers standard	#	pounds (behind
mo	masonry opening		numerals)
nrc	noise reduction coefficient		

END OF SECTION



WARREN WOODS PUBLIC SCHOOLS  
2017 BOND ISSUE-VARIOUS PROJECTS  
BID PACK #13 - REBID

171755N

MAY 26, 2020

E4.28H WARREN WOODS MIDDLE SCHOOL - LIGHTING PLAN - AREA H  
E5.00 ENTERPRISE HIGH SCHOOL - ELECTRICAL COMPOSITE PLAN  
E5.21A ENTERPRISE HIGH SCHOOL - LIGHTING PLAN - AREA A  
E5.22B ENTERPRISE HIGH SCHOOL - LIGHTING PLAN - AREA B  
E5.23C ENTERPRISE HIGH SCHOOL - LIGHTING PLAN - AREA C  
E7.01 HAWTHORN CENTER - ELECTRICAL SITE PLAN

END OF SECTION 00851

SECTION 01010 - SUMMARY OF WORK

PART I - 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 PROJECT:

- A. The project consists of removal and replacement of the existing exit signs and emergency ballasts as shown on the drawings for main corridors of various School District Buildings.
- B. The project also includes construction of (2) two marquee signs: one (1) at the Hawthorn Administrative Center and one (1) at the Transportation Building. Project also includes demolition of an existing planter and rework of the exterior of the main entrance including new concrete and concrete benches.

1.03 SCHEDULE:

- A. After award of contract the schedule will be finalized with the successful bidder and the Warren Woods Public Schools.
- B. Asbestos may be present and if found will be abated by the Owner. There will be no extra costs allowed due to the time required by the Owner for abatement.
- C. The facilities will remain in operation during the construction period. Schedule and work operations must be coordinated with Warren Woods Public Schools.

PARTS 2 & 3 - PRODUCT AND EXECUTION

Not applicable

END OF SECTION 01010

SECTION 01041 - PROJECT COORDINATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

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

1.02 DESCRIPTION:

- A. Contractor shall provide the services of a full time Project Coordinator for the duration of the construction work.
  - 1. Employ someone with not less than five years experience performing coordination work on projects of similar size and scope.
  - 2. Submit name and qualifications to Architect.
- B. Provide additional administrative and supervisory personnel as required for the performance of the work including coordination of the various subcontractors.
- C. Related Requirements Specified in Other Sections:
  - 1. Summary of Work: Section 01010.

1.03 PROJECT COORDINATOR'S DUTIES:

- A. Coordinate the work of the various subcontractors:
  - 1. For temporary utilities.
  - 2. With the work of trades specified in Division 2 through 16.
  - 3. Coordinate work of Owner under separate contract (roof work at Enterprise HS)
- B. Coordinate the schedules of subcontractors.
  - 1. Verify timely deliveries of products for installation by other trades.
  - 2. Verify that labor and materials are adequate to maintain schedules.

C. Maintain conferences among subcontractors and other concerned parties, as necessary to:

1. Maintain coordination and schedules.
2. Resolve matters in dispute.

D. Participate in project meetings:

1. Report progress of work.
2. Recommend needed changes in schedule.

E. Temporary Utilities:

1. Coordinate installation, operation and maintenance, to verify compliance with project requirements and with Contract Documents.
2. Verify adequacy of service at required locations.

F. Shop Drawings, Product Data and Samples:

1. Prior to submittal, review for compliance with Contract Documents.
  - a. Check field dimensions and clearance dimensions.
  - b. Check relation to available space.
  - c. Review the effect of any changes on the work of other contracts or trades.
  - d. Check compatibility with equipment and work of other trades.

G. Coordination Drawings:

1. Prepare, as required to assure coordination of work or to resolve conflicts.
2. Submit for review and transmittal.
3. Reproduce and distribute approved copies to all concerned parties.

H. Observe required testing; maintain a record of tests:

1. Testing agency and name of inspector.
2. Subcontractor.
3. Manufacturer's representative present.
4. Date and time of testing.
5. Type of product or work.
6. Type of test and results.
7. Retesting required.

I. Verify that subcontractors maintain accurate record documents.

J. Substitutions and Changes:

1. Review proposals and requests.
  - a. Check for compliance with Contract Documents.
  - b. Verify compatibility with work and equipment of other trades.
2. Promptly report deficiencies or discrepancies to contractor.

K. Assemble documentation for handling of claims or disputes.

L. Equipment Start-Up:

1. Check to assure that utilities and specified connections are complete and that equipment is in operable condition.
2. Observe test, adjust and balance.
3. Record results, including time and date of start-up.

M. Inspection and Acceptance of Work:

1. Prior to inspection, check that work is complete and ready for acceptance
2. Assist Inspector: Prepare list of items to be completed or corrected.

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3. Should acceptance of work constitute the beginning of the specified guarantee period, prepare and transmit written notice to Contractor for the Owner.

N. Assemble record documents from subcontractors.

END OF SECTION 01041

SECTION 01045 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for cutting and patching.
- B. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
- C. Demolition of selected portions of the building for alterations is included in Specification Section 02070 "Selective Demolition."

1.3 SUBMITTALS

- A. Cutting and Patching Proposal: Where approval of procedures for cutting and patching is required before proceeding, submit a proposal describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal:
  - 1. Describe the extent of cutting and patching required and how it is to be performed; indicate why it cannot be avoided.
  - 2. Describe anticipated results in terms of changes to existing construction; include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.
  - 3. List products to be used and firms or entities that will perform Work.
  - 4. Indicate dates when cutting and patching is to be performed.
  - 5. List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.

6. Where cutting and patching involves addition of reinforcement to structural elements, submit details and engineering calculations to show how reinforcement is integrated with the original structure.
7. Approval by the Architect to proceed with cutting and patching does not waive the Architect's right to later require complete removal and replacement of a part of the Work found to be unsatisfactory.

#### 1.4QUALITY ASSURANCE

- A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.
- B. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.
- C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Architect's opinion, reduce the building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace Work cut and patched in a visually unsatisfactory manner.

#### PART 2 - PRODUCTS

##### 2.1MATERIALS

- A. Use materials that are identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials whose installed performance will equal or surpass that of existing materials.

#### PART 3 - EXECUTION

##### 3.1INSPECTION

- A. Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered.

1. Before proceeding, meet at the site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

### 3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.
- C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Take all precautions necessary to avoid cutting existing pipe or conduit serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

### 3.3 PERFORMANCE

- A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.
  1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.
- B. Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with the original installer's recommendations.
  1. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
  3. Cut through concrete and masonry using a cutting machine such as a carborundum saw or diamond core drill.
  4. Comply with requirements of applicable Sections of Division-2 where cutting and patching requires excavating and backfilling.
  5. By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.
- C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
  2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
  3. Where removal of walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary to achieve uniform color and appearance.
    - a. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken containing the patch, after the patched area has received primer and second coat.

### 3.4 CLEANING

- A. Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove completely paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION 01045

SECTION 01090 - REFERENCE STANDARDS

PART 1 - GENERAL

1.01 SECTION INCLUDES:

- A. Quality assurance.
- B. Schedule of references.

1.02 QUALITY ASSURANCE:

- A. For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date for receiving bids.
- C. Obtain copies of standards when required by Contract Documents.
- D. Maintain copy at job site during submittals, planning, and progress of the specific work, until Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- F. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.03 SCHEDULE OF REFERENCE:

- AA Aluminum Association  
900 19<sup>th</sup> Street, N.W. - Suite 300  
Washington, DC 20006
- AABC Associated Air Balance Council  
1518 K Street N.W.  
Washington, DC 20005
- AASHTO American Association of State Highway  
and Transportation Officials  
444 North Capitol Street, N.W. - Suite 249  
Washington, DC 20001

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ACI American Concrete Institute  
P.O. Box 9094  
Farmington Hills, MI 48333-9094

ADC Air Diffusion Council  
1901 N. Roselle Rd., Suite 800  
Schaumburg, IL 60195

AF&PA American Forest & Paper Association  
1111 19<sup>th</sup> Street, NW, Suite 800  
Washington, DC 20036

AGC Associated General Contractors of America  
2300 Wilson Blvd., Suite 400  
Arlington, VA 22201

AI Asphalt Institute  
2696 Research Park Drive  
Lexington, KY 40511-8480

AIA American Institute of Architects  
1735 New York Avenue, N.W.  
Washington, DC 20006-5292

AISC American Institute of Steel Construction  
One East Wacker Drive  
Suite 3100  
Chicago, IL 60601-2001

AISI American Iron and Steel Institute  
1140 Connecticut Ave - Suite 705  
Washington, DC 20036

AITC American Institute of Timber Construction  
7012 S. Revere Parkway - Suite 140  
Englewood, CO 80112

AMCA Air Movement and Control Association  
30 West University Drive  
Arlington Heights, IL 60004

ANSI American National Standards Institute  
25 West 43<sup>rd</sup> Street, Fourth Floor  
New York, NY 10036

APA American Plywood Association  
Box 11700  
Tacoma, WA 98411-0700

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- ARI Air Conditioning and Refrigeration Institute  
4100 North Fairfax Drive - Suite 200  
Arlington, VA 22203
- ASHRAE American Society of Heating, Refrigeration and  
Air Conditioning Engineers  
1791 Tullie Circle, N.E.  
Atlanta, GA 30329
- ASME American Society of Mechanical Engineers  
Three Park Avenue  
New York, NY 10016-5990
- ASTM American Society for Testing and Materials  
100 Barr Harbor Drive  
West Conshohocken, PA 19428-2959
- AWI Architectural Woodwork Institute  
46179 Westlake Drive, Suite 120  
Potomac Falls, VA 20165
- AWPA American Wood-Preservers' Association  
P.O. Box 5690  
Grandbury, TX 76049
- AWS American Welding Society  
550 N.W. LeJeune Road  
Miami, FL 33126
- AWWA American Water Works Association  
6666 West Quincy Avenue  
Denver, CO 80235
- BIA Brick Institute of America  
1350 Centennial Park Drive, Suite 301  
Reston, VA 20191
- CDA Copper Development Association  
260 Madison Avenue - 16th Floor  
New York, NY 10016
- CLFMI Chain Link Fence Manufacturers Institute  
10015 Old Columbia Road, Suite B-215  
Columbia, MD 21046
- CRSI Concrete Reinforcing Steel Institute  
933 Plum Grove Road  
Schaumburg, IL 60173-4758

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CSSB Cedar Shake and Shingle Bureau  
P.O. Box 1178  
Sumas, WA 98295-1178

DHI Door and Hardware Institute  
14150 Newbrook Drive, Suite 200  
Chantilly, VA 20151

EJCDC Engineers' Joint Contract Documents Committee  
American Council of Engineering Companies  
1015 15th Street, N.W., 8<sup>th</sup> Floor  
Washington, DC 20005

EJMA Expansion Joint Manufacturers Association  
25 North Broadway  
Tarrytown, NY 10591

FGMA Flat Glass Marketing Association  
3310 Harrison  
White Lakes Professional Building  
Topeka, KS 66611

FM Factory Mutual System  
Standards Laboratories Department  
1151 Boston-Providence Turnpike  
Norwood, MA 02062

FS Federal Specification  
General Services Administration  
Specifications and Consumer Information  
Distribution Section (WFSIS)  
1800 F Street, NW  
Washington, DC 20405

GA Gypsum Association  
810 First Street N.W. #510  
Washington, DC 20002-4268

ICC International Code Council  
5203 Leesburg Pike, Suite 600  
Falls Church, VA 22041

IEEE Institute of Electrical and Electronics Engineers  
345 East 47th Street  
New York, NY 10017

IMIAC International Masonry Industry All-Weather Council  
International Masonry Institute  
815 15th Street, N.W.  
Washington, DC 20005

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MBMA Metal Building Manufacturer's Association  
1300 Sumner Avenue  
Cleveland, OH 44115-2351

MFMA Maple Flooring Manufacturers Association  
60 Revere Drive  
Northbrook, IL 60062

MIL Military Specification  
Naval Publications and Forms Center  
700 Robbins Avenue, Building 4, Section D  
Philadelphia, PA 19111-5093

ML/SFA Metal Lath/Steel Framing Association  
Division of National Association of Architectural  
Metal Manufacturers (NAAMM MLIFSA)  
600 South Federal Street, Suite 400  
Chicago, IL 60605

NAAMM National Association of Architectural Metal  
Manufacturers  
800 Roosevelt Road, Building C, Suite 312  
Glen Ellyn, IL 60137

NCMA National Concrete Masonry Association  
2302 Horse Pen Road  
Herndon, VA 22071-3499

NEBB National Environmental Balancing Bureau  
8575 Grovement Circle  
Gaithersburg, MD 20877

NEMA National Electrical Manufacturers' Association  
1300 North 17<sup>th</sup> Street, Suite 1752  
Rosslyn, VA 22209

NFPA National Fire Protection Association  
#1 Battery March Park  
Quincy, MA 02269-9101

NSWMA National Solid Wastes Management Association  
4301 Connecticut Avenue, N.W., Suite 300  
Washington, DC 20008-2304

NTMA National Terrazzo and Mosaic Association  
201 North Maple, Suite 208  
Purcellville, VA 20132

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PCA Portland Cement Association  
5420 Old Orchard Road  
Skokie, IL 60077

PCI Precast Prestressed Concrete Institute  
175 W. Jackson Blvd.-Suite 1859  
Chicago, IL 60604-9773

PS Product Standard  
U.S. Department of Commerce  
1401 Constitution Avenue, N.W.  
Washington, DC 20230

RIS Redwood Inspection Service  
Division of California Redwood Association)  
405 Enfrente Drive  
Novato, CA 94949

SDI Steel Deck Institute  
P.O. Box 25  
Fox River Grove, IL 60021

SDI Steel Door Institute  
c/o Wherry Associates  
30200 Detroit Road  
Cleveland, OH 44145-1967

SIGMA Sealed Insulating Glass Manufacturers Association  
401 N. Michigan Avenue  
Chicago, IL 60611

SJI Steel Joist Institute  
3127 10<sup>th</sup> Avenue North  
Myrtle Beach, SC 29577-6760

SMACNA Sheet Metal and Air Conditioning Contractors'  
National Association  
4201 Lafayette Center Drive  
Chantilly, VA 20151-1209

SSPC Society for Protective Coatings  
40 24<sup>th</sup> Street, 6<sup>th</sup> Floor  
Pittsburgh, PA 15222-4656

TCNA Tile Council of North America, Inc.  
100 Clemson Research Blvd.  
Anderson, SC 29625

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TPI Turfgrass Producers International  
2 East Main Street  
East Dundee, IL 60118

UL Underwriters' Laboratories, Inc.  
333 Pfingston Road  
Northbrook, IL 60062-2096

WCLIB West Coast Lumber Inspection Bureau  
6980 S.W. Varns Road  
Tigard, OR 97223

WDMA Window & Door Manufacturers Associations  
1400 W. Touhy Avenue, Suite 470  
Des Plaines, IL 60018

WWPA Western Wood Products Association  
522 SW Fifth Avenue, Suite 500  
Portland, OR 97204-2122

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION 01090

SECTION 01200 - PROJECT MEETINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for project meetings including but not limited to:
  - 1. Pre-Construction Conference.
  - 2. Pre-Installation Conferences.
  - 3. Coordination Meetings.
  - 4. Progress Meetings.
- B. Construction schedules are specified in Specification Section 01310 "Construction Schedules".

1.3 PRE-CONSTRUCTION CONFERENCE

- A. Schedule a pre-construction conference and organizational meeting at the Project site or other convenient location no later than (14) days after execution of the Agreement and prior to commencement of construction activities. Conduct the meeting to review responsibilities and personnel assignments.
- B. Attendees: The Owner, Architect/Engineer and their consultants, the Contractor and its superintendent, major subcontractors, manufacturers, suppliers, independent testing agency and other concerned parties shall each be represented at the conference by persons familiar with and authorized to conclude matters relating to the work.
- C. Agenda: Discuss items of significance that could affect progress including such topics as:
  - 1. Tentative construction schedule.
  - 2. Critical work sequencing.
  - 3. Designation of responsible personnel.
  - 4. Procedures for processing field decisions and Change Orders.
  - 5. Procedures for processing Applications for Payment.
  - 6. Distribution of Contract Documents.

7. Submittal of Shop Drawings, Product Data and Samples.
8. Preparation of record documents.
9. Use of the premises.
10. Office, Work and storage areas.
11. Equipment deliveries and priorities.
12. Safety procedures.
13. First aid.
14. Security.
15. Housekeeping.
16. Working hours.

1.4 PRE-INSTALLATION CONFERENCES

- A. Conduct a pre-installation conference at the site before each construction activity that requires coordination with other construction. The Installer and representatives of manufacturers and fabricators involved in or affected by the installation, and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise the Architect and Owner of scheduled meeting dates.

1. Review the progress of other construction activities and preparations for the particular activity under consideration at each pre-installation conference, including requirements for:
  - a. Contract Documents.
  - b. Options.
  - c. Related Change Orders.
  - d. Purchases
  - e. Deliveries.
  - f. Shop Drawings, Product Data and quality control Samples.
  - g. Possible conflicts.
  - h. Compatibility problems.
  - i. Time schedules.
  - j. Weather limitations.
  - k. Manufacturer's recommendations.
  - l. Compatibility of materials.
  - m. Acceptability of substrates.
  - n. Temporary facilities.
  - o. Space and access limitations.
  - p. Governing regulations.
  - q. Safety.
  - r. Inspection and testing requirements.
  - s. Required performance results.
  - t. Recording requirements.
  - u. Protection.

2. Record significant discussions and agreements and disagreements of each conference, along with the approved schedule. Distribute the record of the meeting to everyone concerned, promptly, including the Owner and Architect.
3. Do not proceed if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene the conference at the earliest feasible date.

#### 1.5 COORDINATION MEETINGS

- A. Conduct Project coordination meetings at regularly scheduled times convenient for all parties involved. Project coordination meetings are in addition to specific meetings held for other purposes, such as regular progress meetings and special pre-installation meetings.
- B. Request representation at each meeting by every party currently involved in coordination or planning for the construction activities involved.
- C. Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

#### 1.6 PROGRESS MEETINGS

- A. Conduct progress meetings at the Hawthorn Administrative Service Center. Notify the Owner and Architect/Engineer of scheduled meeting dates. Coordinate dates of meetings with preparation of the payment request.
- B. Attendees: In addition to representatives of the Owner and Architect/Engineer, each subcontractor, supplier, independent testing agency or other entity concerned with current progress or involved in planning, coordination or performance of future activities shall be represented at these meetings by persons familiar with the Project and authorized to conclude matters relating to progress.
- C. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the current status of the Project.

1. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
  2. Review the present and future needs of each entity present, including such items as:
    - a. Interface requirements.
    - b. Time.
    - c. Sequences.
    - d. Deliveries.
    - e. Off-site fabrication problems.
    - f. Access.
    - g. Site utilization.
    - h. Temporary facilities and services.
    - i. Hours of Work.
    - j. Hazards and risks.
    - k. Housekeeping.
    - l. Quality and Work standards.
    - m. Change Orders.
    - n. Documentation of information for payment requests.
- D. Reporting: No later than (3) days after each progress meeting date, distribute copies of minutes of the meeting to each party present and to other parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
1. Schedule Updating: Revise the construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01200

SECTION 01310 - CONSTRUCTION SCHEDULES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

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

1.02 DESCRIPTION OF REQUIREMENTS:

- A. General: This section specifies the particular administrative and procedural requirements for progress time scheduling and progress reporting for the performance of the work, as indicated in the General Conditions and elsewhere in the Contract Documents. Refer also to the General Conditions and to the "Contractor" for definition and specific dates of the Contract Time.
- B. Scheduling Responsibility: Submission of Contractor's progress schedule to the Owner, Architect/Engineer, or independent testing agency shall not relieve the Contractor of his total responsibility for the requirements of the Contract Documents, including adverse effects such as delays resulting from ill-timed work; refer to General Conditions.

1.03 FORM OF SCHEDULES:

- A. Contractor shall prepare a "Plan of Operations and Progress Schedule" which shall show concisely the manner in which different phases of the work are to be started, methods and speed for the inter-relationship of the work under the various contracts, times upon which different phases of the work are to be started, methods and speed for progressing the different phases and dates upon which the certain subcontractors are dependent upon that under other subcontracts.
- B. The plan of operations and progress schedule shall be "weighed" to schedule each trade in proportion to the entire project, both physically and financially.
- C. In preparing the above plan of operations and progress schedule, the Contractor shall assure that the methods, dates and other pertinent matters are acceptable to the Architect/Engineer and, when completed, he shall submit to and obtain approval from the Architect/Engineer and Owner.

- D. After approval of the above plan of operations and progress schedule, the Contractor shall be responsible for seeing that it is adhered to and for ascertaining that proper coordination is maintained between work of all Contracts.

1.04 PROGRESS REVISIONS:

- A. Indicate progress of each activity to date of submission.
- B. Show changes occurring since previous submission of schedule:
  - 1. Major changes in scope.
  - 2. Activities modified since previous submission.
  - 3. Revised projections of progress and completion.
  - 4. Other identifiable changes.
- C. Provide a narrative report as needed to define:
  - 1. Problem areas, anticipated delays, and the impact on the schedule.
  - 2. Corrective action recommended and its effect.
  - 3. The effect of changes on schedules of other contractors.

1.05 SUBMISSIONS:

- A. Submit initial schedules within (14) days after award of Contract.
  - 1. Architect/Engineer and Owner will review schedules and return review copy within (10) days after receipt.
  - 2. Resubmit within (10) days after return of review copy.
- B. Submit a revised and updated progress schedule and narratives with each application for payment, but not less than once a month until project is complete.

1.06 DISTRIBUTION:

- A. Distribute copies of the reviewed schedules and narratives to:
  - 1. Job site file.
  - 2. Subcontractors.
  - 3. Other concerned parties.

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

1.07 DAILY REPORTS:

- A. Contractor shall prepare a daily report, recording the following information concerning events at the site and submit duplicate copies to the Architect and Owner at regular intervals not exceeding weekly intervals.

1. List of subcontractors at the site.
2. List of separate contractors at the site.
3. Count of personnel at the site.
4. High/low temperatures, general weather conditions.
5. Accidents (refer to accident reports).
6. Meetings and significant decisions.
7. Unusual events.
8. Stoppages, delays, shortages, losses.
9. Emergency procedures, field orders.
10. Orders/requests by governing authorities.
11. Change orders received, implemented.

PART 2 and 3 - PRODUCTS AND EXECUTION - Not Applicable

END OF SECTION 01310

SECTION 01340 - SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

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

1.02 DESCRIPTION:

- A. Submit shop drawings, product data and samples as required by the Contract Documents. Individual submittal requirements are specified in applicable sections for each unit of work. Receive, check and coordinate all submittals of contractors as provided herein.
- B. Definitions:
  - 1. Shop Drawings are drawings, diagrams, schedules and other data specifically prepared for the Work by the Contractor or any subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.
  - 2. Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate a material, product or system for some portion of the Work.
  - 3. Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the work will be judged.

1.03 SUBMITTAL REQUIREMENTS:

- A. Coordinate preparation and processing of submittals with performance of the work so that work will not be delayed by submittals. Coordinate and sequence different categories of submittals for the same work, and for interfacing units of work, so that one will not be delayed for coordination with another. No extension of time will be allowed because of failure to properly coordinate and sequence submittals.
- B. Submit minimum one pdf version of each shop drawing, including fabrication, erection, layout and setting drawings and such other drawings as required under various sections of the Specifications, until final acceptance is obtained.

Prepare drawings legible, drawing plans, elevations, sections and details in scales required and printable at 100% scale on sheets. Sheets not larger than 30" x 42" nor smaller than 11" x 17". Photo reproductions of contract documents are not an acceptable submittal. Submit copies of manufacturer's descriptive data including catalog sheets for materials, equipment and fixtures, showing dimensions, performance characteristics and capacities, wiring diagrams and controls, schedules, and other pertinent information as required. Where materials describe more than one product or model, clearly identify which is to be furnished.

- C. Shop drawings, product data and samples shall be dated including Contractor and Subcontractor dates of submittal and approval, and marked to show the names of the Project, Architect, manufacturer or supplier, and separate detailer if pertinent. Shop drawings shall completely identify Specification section and locations at which materials or equipment are to be installed. Reproductions of Contract Drawings are acceptable as Shop Drawings only when specifically authorized in writing by the Architect.
- D. Submission of shop drawings, product data and samples shall be accompanied by a copy of a transmittal letter containing Project name, Contractor's name, number of drawings, and samples, titles and other pertinent data. Transmittal shall bear signature of the Contractor as evidence he checked same and found them in conformance with the Contract Documents.
- E. The Contractor shall review, approve and submit, with reasonable promptness and in such sequence as to cause no delay in the Work or in the work of the Owner or any separate contractor, all Shop Drawings, Product Data and Samples required by the Contract Documents.
- F. By approving and submitting Shop Drawings, Product Data and Samples, the Contractor represents that they have determined and verified all materials, field measurements, and field construction criteria related thereto, or will do so, and that he has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.
- G. The Contractor shall not be relieved of responsibility for the deviation from the requirements of the Contract Documents by the Architect's acceptance of Shop Drawings, Product Data or Samples under Paragraph 13.12 of the General Conditions, unless the Contractor has specifically informed the Architect in writing of such deviation at the time of sub-deviation.

The Contractor shall not be relieved from responsibility for errors or omissions in the Shop Drawings, Product Data or Samples by the Architect's acceptance thereof.

- H. The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data or Samples, to revisions other than those requested by the Architect on previous submittals.
- I. No portion of the Work requiring submission of a Shop Drawing, Product Data or Sample shall be commenced until the submittal has been accepted by the Architect as provided in Paragraph 13.12 of the General Conditions. All such portions of the Work shall be in accordance with approved submittals.
- J. Architect will review Shop Drawings, Product Data and Samples as provided in Paragraph 13.12 of the General Conditions. He will mark each such submittal as follows:
  - 1. Accepted - Where no comment made.
  - 2. Accepted as Noted - Where comments indicated on submittal qualifying, modifying, or otherwise changing it; however, submittal can be used for ordering, fabrication and erection at contractor's own risk until revised submittals have been made, reviewed and stamped approved.
  - 3. Revise & resubmit - Where comments indicated on submittal require revisions and resubmission prior to ordering and/or fabrication and erection.
  - 4. Rejected - Where proposed submittals do not conform to the contract documents.
- K. Contractor is responsible for obtaining and distributing required prints of shop drawings to his subcontractors and material suppliers; after as well as before final approval. Prints of reviewed shop drawings shall be made from transparencies which carry the Architect's appropriate stamp.
- L. Obtain copies of all shop drawings, product data and samples submitted to date and accepted from other contractors.

PARTS 2 and 3 - PRODUCT AND EXECUTION

Not applicable.  
END OF SECTION 01340

SECTION 01370 - SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Requirements, and to other Sections of Division 1, General Requirements, which are hereby made a part of this Section.

1.02 DESCRIPTION OF WORK:

- A. Upon request submit to the Architect a preliminary schedule of values within (3) three days of submission of bids for review prior to Contractor interviews. The schedule of values provided under 1.02A will not be considered final for purposes of the contract or for purposes of payment.
- B. Submit to the Architect a Schedule of Values allocated to the various portions of the work, within (10)ten days after award of contract.
- C. Upon request of the Architect, support the values with data which will substantiate their correctness.
- D. The Schedule of Values, unless objected to by the Architect or Owner, shall be used only as the basis for the Contractor's Applications for Payment.

1.03 FORM AND CONTENT OF SCHEDULE OF VALUES:

- A. Use AIA Forms G702 and G702A or forms provided by Owner.
- B. Schedule shall list the installed value of the component parts of the work in sufficient detail to serve as a basis for computing values for progress payments during construction.
- C. Follow the table of contents of Sections as the format for listing component items.
  - 1. Identify each line item with the number and title of the respective major section of the specifications.
- D. For each major line item list sub-values of major products or operations under the item.
  - 1. Each item shall include a directly proportional amount of the Contractor's overhead and profit.

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- E. The sum of all values listed in the schedules shall equal the total Contract Sum.

PARTS 2 AND 3 - PRODUCTS AND EXECUTION - Not Applicable

END OF SECTION 01370

SECTION 01400 - QUALITY CONTROL

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:

- A. Specific quality control requirements for the work are indicated throughout the contract documents. The term "Quality Control" includes, but is not necessarily limited to, inspection and testing and associated requirements. This section does not specify or modify Architect's duties relating to quality control and Contract enforcement.
- B. Coordinate quality control programs of separate contractors including submittals, conferences and on site programs.

1.03 RESPONSIBILITY:

- A. Residual Contractor Responsibility: Whatever required, inspection, testing and similar quality control provisions to be performed by independent agencies (not directly by the Contractor), and not indicated to be Owner's responsibility, shall be the Contractor's responsibility. The costs for those required services by independent testing laboratories are recognized to be included in Contract Sum.
- B. Contractor's General Responsibility: No failure of test agencies, whether engaged by Owner or Contractor, to perform adequate inspections or tests or to properly analyze or report results, shall relieve Contractor of responsibility for fulfillment of requirements of contract documents. It is recognized that required inspection and testing program is intended to assist the Contractor, Owner, Architect, and governing authorities in nominal determination of probable compliances with requirements for certain elements of work. The program is not intended to limit the Contractor's regular quality control program, as needed for general assurance of compliances.

1.04 QUALITY ASSURANCE:

- A. General Workmanship Standards: Comply with recognized workmanship quality standards within the industry as applicable to each unit of work, including ANSI standards where applicable. It is a requirement that each category of trades person or installer performing the work be prequalified, to the extent of being familiar with applicable and recognized quality standards for that category of work, and being capable of workmanship complying with those standards.
- B. Qualification of Quality Control Agencies: Except where another qualification standard is indicated, and except where it is specifically indicated that use of prime product manufacturer's test facilities is acceptable, engage independent testing laboratories complying with "Recommended Requirements for Independent Laboratory Qualifications" as published by American Council of Independent Laboratories, and specializing in type(s) of inspections and tests required.

1.05 SUBMITTALS:

- A. General: Refer to Section 01340, "Shop Drawings, Product Data and Samples" for requirements applicable to inspection and test reports, quality control samples, maintenance agreements, warranties, and similar documentation of quality compliances as required. Refer to individual work sections of Division 2 through 16 for specific certification and submittal requirements.
- B. Copies and Distribution: Where inspection and test reports and certifications are required by governing authorities, provide additional copies as required, and where required, send copies directly from inspection or testing agency to governing authority.

1.06 PRODUCT DELIVERY, STORAGE, AND HANDLING:

- A. General: Handle, store and protect materials and products, including fabricated components, by methods and means which will prevent damage, deterioration and losses including theft (and resulting delays), thereby ensuring highest quality results as performance of the work progresses. Control delivery schedules so as to minimize unnecessary long-term storage at project site prior to installation.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION:

3.01 PREPARATION FOR INSTALLATION:

- A. Pre-Installation Conferences: Well in advance of installation of every major unit of work which requires coordination with other work, meet at the project site with installers and representatives of manufacturers and fabricators who are involved in or affected by the unit of work, and in its coordination or integration with other work which has proceeded or will follow. Advise Architect and Owner of scheduled meeting dates. At each meeting, review progress of other work and preparations for particular work under consideration, including requirements of contract documents, options, related change orders, purchases, deliveries, shop drawings, product data, quality control samples, possible conflicts, compatibility problems, time schedule, weather limitations, temporary facilities, space and access limitations, structural limitations, governing regulations, safety, inspection and testing requirements required performance results, recording requirements, and protection. Record significant discussions of each conference, and agreements and disagreements along with final plan of action. Distribute record of meeting promptly to everyone concerned, including Architect and Owner.
1. Do not proceed with the work if associated pre-installation conference cannot be concluded successfully. Instigate actions to resolve impediments to performance of the work, and reconvene conference at earliest date feasible.
- B. Installer's Inspection of Conditions: Require Installer of each major unit of work to inspect substrate to receive the work, and conditions under which the work will be performed, and to report (in writing to the Contractor) unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.02 COORDINATION OF TEST AGENCY WORK:

- A. Coordination with Owner's Agencies: Afford access and reasonable time in construction sequence for Owner's inspection and tests to be performed. Cooperate with agencies and provide incidental labor and services needed for the removal and delivery of test samples, and for inspections and taking measurements. Provide patching and restoration services where test samples have been removed, complying with individual technical sections of Divisions 2 through 16.
1. Except for specialized laboratory sampling equipment, and except as otherwise indicated, supply and operate tools and construction equipment needed to obtain test samples from the work, including cutting devices for sawing, drilling, flame-cutting, coring and similar operations. Assist agencies in labeling and packing of test samples removed from the work.
- B. Coordination with Contractor's Independent Agencies: Except for required independent agency activities of inspection, measuring, testing, analyzing, reporting and similar activities, the assignment of labor, equipment, cutting, Patching and similar necessary activities associated therewith are Contractor's option recognizing that entire activity is Contractor's responsibility.
- C. Test Agency Responsibilities:
1. Test agencies, regardless of whether engaged by Owner or Contractor, are not authorized to change or negate requirements of Contract Documents. Each agency shall coordinate its assigned work with construction schedule as maintained by Contractor, and shall perform its work promptly so as not to delay the work. Observances (by agencies) having a bearing on the work shall be reported to Architect in most expeditious way possible, and shall be recorded in writing by agency. Agency personnel shall not interfere with or assume duties of Contractor.
  2. Reports: The testing agency shall prepare reports of inspections and laboratory tests, including analysis and interpretation of test results where applicable. Properly identify each report and, where required, provide agency's certification of test results. Describe test methods used, and compliance with recognized test standards (if any). Complete and submit report at earliest possible date in each case.

3.03 INSTALLATION QUALITY CONTROL:

- A. Manufacturer's Instructions: Where installations include manufactured products, comply with manufacturer's applicable instructions and recommendations for installation, to whatever extent these are more explicit or more stringent than applicable requirements indicate in contract documents.
- B. Inspect each item of materials or equipment, immediately prior to installation, and reject damaged and defective items.
- C. Provide attachment and connection devices and methods for securing work properly as it is installed; true to line and level, and within recognized industry tolerances, if not otherwise indicated. Allow for expansions and building movements. Provide uniform joint widths in exposed work, organized for best possible visual effect. Refer questionable visual effect choices to Architect for final decision.
- D. Recheck measurements and dimensions of the work, as an integral step of starting each installation.
- E. Install work during conditions of temperature, humidity, exposed, forecasted weather, and status of project completion which will ensure best possible results for each unit of work, in coordination with entire work. Isolate each unit of work from non-compatible work, as required to prevent deterioration.
- F. Coordinate enclosure (closing-in) of work with required inspections and tests, so as to avoid necessity of uncovering work for that purpose.
- G. Mounting Heights: Except as otherwise indicated, mount individual units of work at industry-recognized standard mounting heights, for applications indicated. Refer questionable mounting height choices to Architect for final decision.
- H. Adjust, clean, lubricate, restore, marred finished, and protect newly installed work, to ensure that it will remain without damage or deterioration during the remainder of construction period.

END OF SECTION 01400

SECTION 01500 - TEMPORARY FACILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies requirements for temporary services and facilities, including utilities, construction and support facilities, security and protection.
- B. Temporary utilities required include but are not limited to:
  - 1. Not applicable
- C. Temporary construction and support facilities required include but are not limited to:
  - 1. Waste disposal services.
  - 2. Construction aids and miscellaneous services and facilities.
- D. Security and protection facilities required include but are not limited to:
  - 1. Temporary fire protection.
  - 2. Barricades, warning signs, lights.
  - 3. Sidewalk bridge or enclosure fence for the site.
  - 4. Environmental protection.

1.3 SUBMITTALS

- A. Not applicable.

1.4 QUALITY ASSURANCE

- A. Regulations: Comply with industry standards and applicable laws and regulations if authorities having jurisdiction, including but not limited to:
  - 1. Building Code requirements.
  - 2. Health and safety regulations.
  - 3. Utility company regulations.

4. Police, Fire Department and Rescue Squad rules.
  5. Environmental protection regulations.
- B. Standards: Comply with NFPA Code 241, "Building Construction and Demolition Operations", ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library "Temporary Electrical Facilities."
1. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", prepared jointly by AGC and ASC, for industry recommendations.
  2. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with National Electric Code (NFPA 70).
- C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

#### 1.5 PROJECT CONDITIONS

- A. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.

#### PART 2 - PRODUCTS

##### 2.1 MATERIALS

- A. General: Provide new materials; if acceptable to the Architect, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.
- B. Tarpaulins: Provide waterproof, fire-resistant, UL labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures provide translucent nylon reinforced laminated polyethylene or polyvinyl chloride fire retardant tarpaulins.
- C. Water: Contractor may use Owner's water service.

- D. Open-Mesh Fencing: Provide 11-gage, galvanized 2-inch, chain link fabric fencing 6-feet high with galvanized barbed wire top strand and galvanized steel pipe posts, 1-1/2" I.D. for line posts and 2-1/2" I.D. for corner posts.

## 2.2EQUIPMENT

- A. General: Provide new equipment; if acceptable to the Architect, undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for use intended.
- B. Water Hoses: Provide 3/4" heavy-duty, abrasion-resistant, flexible rubber hoses 100 ft. long, with pressure rating greater than the maximum pressure of the water distribution system; provide adjustable shut-off nozzles at hose discharge.
- C. Electrical Outlets: Provide properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button and pilot light, for connection of power tools and equipment.
- D. Electrical Power Cords: Provide grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.
- E. Toilets: Contractor may use Owner's designated toilet facilities.
- F. First Aid Supplies: Comply with governing regulations.
- G. Fire Extinguishers: Provide hand-carried, portable UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures.
  - 1. Comply with NFPA 10 and 241 for classification, extinguishing agent and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.1INSTALLATION

- A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed, or are replaced by authorized use of completed permanent facilities.

3.2TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION

- A. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F (27 deg C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.

3.3SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer as requested by the Architect.
- B. Temporary Fire Protection: Until fire protection needs are supplied by permanent facilities, install and maintain temporary fire protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers," and NFPA 241 "Standard for Safeguarding Construction, Alterations and Demolition Operations."
  - 1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.

2. Store combustible materials in containers in fire-safe locations.
  3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.
  4. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.
- C. Permanent Fire Protection: At the earliest feasible date in each area of the Project, complete installation of the permanent fire protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.
- D. Barricades, Warning Signs and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed provide lighting, including flashing red or amber lights.
- E. Enclosure Fence: When excavation begins, install an enclosure fence with lockable entrance gates. Locate where indicated, or enclose the entire site or the portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs and other animals from easily entering the site, except by the entrance gates.
1. Provide open-mesh, chain-link fencing with posts set in a compacted mixture of gravel and earth.
- F. Security Enclosure and Lockup: Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft and similar violations of security.
1. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.

- G. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment which produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.

### 3.4 OPERATION, TERMINATION AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation and similar facilities on a 24-hour day basis where required to achieve indicated results and to avoid possibility of damage.
  2. Protection: Prevent water filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.
- C. Termination and Removal: Unless the Architect requests that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of the Contractor. The Owner reserves the right to take possession of Project identification signs.

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2. At Substantial Completion, clean and renovate permanent facilities that have been used during the construction period, including but not limited to:
  - a. Replace air filters and clean inside of ductwork and housings.
  - b. Replace significantly worn parts and parts that have been subject to unusual operating conditions.
  - c. Replace lamps that are burned out or noticeably dimmed by substantial hours of use.

END OF SECTION 01500

SECTION 01600 - MATERIAL AND EQUIPMENT

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:

- A. Material and equipment incorporated into the work:
  - 1. Conform to applicable specifications and standards.
  - 2. Comply with size, make, type and quality specified, or as specifically approved in writing by the architect.
  - 3. Manufactured and Fabricated Products:
    - a. Design, fabricate and assemble in accord with the best engineering and shop practices.
    - b. Manufacture like parts of duplicate units to standard sizes and gages, to be interchangeable.
    - c. Two or more items of the same kind shall be identical, by the same manufacturer.
    - d. Products shall be suitable for service conditions.
    - e. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.
  - 4. Do not use material or equipment for any purpose other than that for which it is designed or is specified.

1.03 MANUFACTURER'S INSTRUCTIONS:

- A. When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, obtain and distribute copies of such, including three copies to Architect.
  - 1. Maintain one set of complete instructions at the job site during installation and until completion.

- B. Handle, install, connect, clean, condition and adjust products in strict accord with such instructions and in conformity with specified requirements.
  - 1. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Architect for further instructions.
  - 2. Do not proceed with work without clear instructions.
- C. Perform work in accord with manufacturer's instructions. Do not omit preparatory step or installation procedure unless specifically modified or exempted by contract documents.

1.04 TRANSPORTATION AND HANDLING:

- A. Arrange deliveries of products in accord with construction schedules, coordinate to avoid conflict with work and conditions at the site.
  - 1. Immediately on delivery, inspect shipments to assure compliance with requirements of contract documents and approved submittals, and that products are properly protected and undamaged.
- B. Provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

1.05 STORAGE AND PROTECTION:

- A. Store products in accord with manufacturer's instructions, with seals and labels intact and legible.
  - 1. Store products subject to damage by the elements in weather tight enclosures.
  - 2. Maintain temperature and humidity within the ranges required by manufacturer's instructions.
- B. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions, and free from damage or deterioration.

C. Preparation After Installation:

1. Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove when no longer needed.

1.06 SUBSTITUTIONS AND PRODUCT OPTIONS:

A. Products List:

1. Within (14) days after contract date, submit to Architect a complete list of major products proposed to be used, with the name of the manufacturer and the installing subcontractor. Comply with provisions for Contractor's Options and Substitutions.

B. Contractor's Options:

1. For products specified only by reference standard, select any product meeting that standard.
2. For products specified by naming several products or manufacturers, select any one of the products or manufacturers named, which complies with the specifications.
3. For products specified by naming one or more products or manufacturers and "or equal," Contractor must submit a request as for substitutions for any product or manufacturer not specifically named.
4. For products specified by naming only one product and manufacturer, there is no option.

C. Substitutions:

1. For a period of (14) days after contract date, Architect will consider written requests from Contractor for substitution of products.
2. Submit a separate request for each product, supported with complete data, with drawings and samples as appropriate, including:
  - a. Comparison of the qualities of the proposed substitution with that specified.
  - b. Changes required in other elements of the work because of the substitution.

- c. Effect on the construction schedule.
  - d. Cost data comparing the proposed substitution with the product specified.
  - e. Any required license fees or royalties.
  - f. Availability of maintenance service, and source of replacement materials.
3. Architect shall be the judge of the acceptability of the proposed substitution except where a change in cost is involved.

D. Contractor's Representation:

1. A request for a substitution constitutes a representation that Contractor:
  - a. Has investigated the proposed product and determined that it is equal to or superior in all respects to that specified.
  - b. Will provide the same warranties or bonds for the substitution as for the product specified.
  - c. Will coordinate the installation of an accepted substitution into the work, and meet such other changes as may be required to make the work complete in all respects.
  - d. Waives all claims for additional costs, under his responsibility which may subsequently become apparent.

E. Architect will review requests for substitutions with reasonable promptness, and notify Contractor, in writing, of the decision to accept or reject the requested substitution.

PARTS 2 AND 3 PRODUCTS AND EXECUTION

Not applicable.

END OF SECTION 01600

SECTION 01700 - PROJECT CLOSEOUT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:
  - 1. Inspection procedures.
  - 2. Project record document submittal.
  - 3. Operating and maintenance manual submittal.
  - 4. Submittal of warranties.
  - 5. Final cleaning.
- B. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 2 through 16.

1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.
  - 1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
    - a. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
  - 2. Advise Owner of pending insurance change-over requirements.
  - 3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.

4. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities; include occupancy permits, operating certificates and similar releases.
5. Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.

B. Inspection Procedures: On receipt of a request for inspection, the Architect will either proceed with inspection or advise the Contractor of unfilled requirements. The Architect will prepare the Certificate of Substantial Completion following inspection, or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.

1. The Architect will repeat inspection when requested and assured that the Work has been substantially completed.
2. Results of the completed inspection will form the basis of requirements for final acceptance.

#### 1.4 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
3. Submit a certified copy of the Architect's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Architect.
4. Submit consent of surety to final payment.
5. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Reinspection Procedure: The Architect will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Architect.

1. Upon completion of reinspection, the Architect will prepare a certificate of final acceptance, or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
2. If necessary, reinspection will be repeated.

1.5 RECORD DOCUMENT SUBMITTALS

- A. General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Architect's reference during normal working hours.
- B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
  1. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.
  2. Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.
  3. Note related Change Order numbers where applicable.
  4. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.
- C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data.
  1. Upon completion of the Work, submit record Specifications to the Architect for the Owner's records.

- D. Record Product Data: Maintain one copy of each Product Data submittal. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark-up of record drawings and Specifications.
1. Upon completion of mark-up, submit complete set of record Product Data to the Architect for the Owner's records.
- E. Record Sample Submitted: Immediately prior to the date or dates of Substantial Completion, the Contractor will meet at the site with the Architect and the Owner's personnel to determine which of the submitted Samples that have been maintained during progress of the Work are to be transmitted to the Owner for record purposes. Comply with delivery to the Owner's Sample storage area.
- F. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Architect for the Owner's records.
- G. Maintenance Manuals: Organize operating and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual heavy-duty 2-inch, 3-ring vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information:
1. Emergency instructions.
  2. Copies of warranties.
  3. Recommended maintenance.
  4. Inspection procedures.
  5. Product Data.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES

- A. Operating and Maintenance Instructions: Arrange for each installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:
  - 1. Maintenance manuals.
  - 2. Record documents.
  - 3. Hazards.
  - 4. Cleaning.
  - 5. Warranties and bonds.
  - 6. Maintenance agreements and similar continuing commitments.

3.2 FINAL CLEANING

- A. General: General cleaning during construction is required by the General Conditions and as required under applicable specifications sections (Division 2 thru 16).
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
  - 1. Clean transparent materials, including glass in doors and windows from any construction debris. Replace chipped or broken glass (from construction debris) and other damaged (during construction activities) transparent materials.
  - 2. Clean exposed exterior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Leave concrete floors broom clean.
  - 3. Clean the construction site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits.
  - 4. Execute final cleaning prior to final inspection.
  - 5. Clean interior and exterior surfaces exposed to view. Vacuum carpeted and soft surfaces.

6. Clean, Replace filters of operating equipment.
  7. Remove waste and surplus materials, rubbish, and construction facilities from site.
- C. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.
- D. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.
1. Where extra materials of value remaining after completion of associated Work have become the Owner's property, arrange for disposition of these materials as directed.

END OF SECTION 01700

WARREN WOODS PUBLIC SCHOOLS  
2017 BOND ISSUE-VARIOUS PROJECTS  
BID PACK #13 - REBID 171755N

MAY 26, 2020

SECTION 01800 - GUARANTEE - WARRANTY

PART ONE - GENERAL

1.01 GUARANTEE PERIOD

- A. The General Contractor shall and hereby does guarantee and warrant that all work for this building, under this Contract, shall be free from defects or faulty labor and/or materials for a period of **two (2) years** from the date of Final Acceptance of same, except when longer periods are herein specified, which develop within any guarantee periods.

1.02 FINAL PAYMENT

- A. Final payment is contingent upon the Owner's Representative's receipt of such guarantees and/or warranties from the General Contractor.

END OF SECTION 01800

SECTION 02070 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section requires the selective removal and subsequent offsite disposal of the following:
  - 1. Removal, salvage and reinstallation of existing acoustic ceiling tile as required to remove and replace electrical items.
  - 2. Removal of existing unused above ceiling technology wiring in main corridors (refer to allowances).
  - 3. Removal of existing exit signs and emergency ballasts as shown on documents.
- B. Removal work specified elsewhere:
  - 1. Cutting concrete walks, curbs and asphalt and removal of existing exterior ground mounted signs and sign foundations is included in the work of Spec Section 02220 "Site Demolition".
  - 2. Cutting nonstructural concrete floors and masonry walls for piping, ducts, and conduits is included with the work of the respective mechanical and electrical specification sections in Divisions 21 thru 28.
- C. Related work specified elsewhere:
  - 1. Remodeling construction work and patching are included within the respective sections of specifications, including removal of materials for reuse and incorporation into remodeling or new construction.
  - 2. Relocation and/or removal of pipes, conduits, ducts, and other mechanical and electrical work is specified in other Divisions.

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Schedule indicating proposed sequence of operations for selective demolition work to the Owner's representative for review prior to start of work. Include coordination for shutoff, capping, and continuation of utility services as required, together with details for dust and noise control protection.
- C. Photographs of existing conditions of structure surfaces, equipment, and adjacent improvements that might be misconstrued as damage related to removal operations are to be filed with the Owner's representative prior to the start of work.

1.4 JOB CONDITIONS

- A. Occupancy: Owner will occupy portions of the building immediately adjacent to areas of selective demolition. Conduct selective demolition work in manner that will minimize need for disruption of Owner's normal operations. Provide minimum of 72 hours advance notice to Owner of demolition activities that will affect Owner's normal operations.
- B. Condition of Structures: Owner assumes no responsibility for actual condition of items or structures to be demolished.
  - 1. Conditions existing at time of inspection for bidding purposes will be maintained by Owner insofar as practicable. However, minor variations within structure may occur by Owner's removal and salvage operations prior to start of selective demolition work.
- C. Partial Demolition and Removal: Items indicated to be removed but of salvageable value to Contractor may be removed from structure as work progresses. Transport salvaged items from site as they are removed.
  - 1. Storage or sale of removed items on site will not be permitted.
- D. Protections: Provide temporary barricades and other forms of protection to protect Owner's personnel and general public from injury due to selective demolition work.

1. Provide protective measures as required to provide free and safe passage of Owner's personnel and general public to occupied portions of building.
  2. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or element to be demolished and adjacent facilities or work to remain.
  3. Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.
  4. Protect floors with suitable coverings when necessary.
  5. Construct temporary minimum one hour fire rated, insulated dustproof partitions where required to separate areas where noisy or extensive dirt or dust operations are performed. Equip partitions with dustproof doors and security locks.
  6. Provide temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces and installation of new construction to ensure that no water leakage or damage occurs to structure or interior areas of existing building.
  7. Remove protections at completion of work.
- E. Damages: Promptly repair damages caused to adjacent facilities by demolition work.
- F. Traffic: Conduct selective demolition operations and debris removal to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.
1. Do not close, block, or otherwise obstruct streets, walks, or other occupied or used facilities without written permission from The Authorities Having Jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- G. Flame Cutting: Do not use cutting torches for removal until work area is cleared of flammable materials. At concealed spaces, such as interior of ducts and pipe spaces, verify condition of hidden space before starting

flame-cutting operations. Maintain portable fire suppression devices during flame-cutting operations.

- H. Utility Services: Maintain existing utilities indicated to remain in service and protect them against damage during demolition operations.
  - 1. Do not interrupt utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.
  - 2. Maintain fire protection services during selective demolition operations.
- I. Environmental Controls: Use water sprinkling, temporary enclosures, and other methods to limit dust and dirt migration. Comply with governing regulations pertaining to environmental protection.
  - 1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 PREPARATION

- A. General: Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of areas to be demolished and adjacent facilities to remain.
  - 1. Cease operations and notify the Owner's representative, Architect and Owner immediately if safety of structure appears to be endangered. Take precautions to support structure until determination is made for continuing operations.
  - 2. Cover and protect furniture, equipment, and fixtures from soilage or damage when demolition work is performed in areas where such items have not been removed.

3. Erect and maintain minimum one hour fire rated dust-proof partitions and closures as required to prevent spread of dust or fumes to occupied portions of the building.
  - a. Where selective demolition occurs immediately adjacent to occupied portions of the building, construct dust-proof partitions of minimum 4-inch studs, 5/8-inch drywall (joints taped) on occupied side, 1/2-inch fire-retardant plywood on demolition side. Fill partition cavity with sound-deadening insulation.
  - b. Provide weatherproof closures for exterior openings resulting from demolition work.
  
4. Locate, identify, stub off, and disconnect utility services that are not indicated to remain.
  - a. Provide bypass connections as necessary to maintain continuity of service to occupied areas of building. Provide minimum of 72 hours advance notice to Owner if shutdown of service is necessary during changeover.

### 3.2 DEMOLITION

- A. General: Perform selective demolition work in a systematic manner. Use such methods as required to complete work indicated on Drawings in accordance with demolition schedule and governing regulations.
  1. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain using power-driven masonry saw or hand tools; do not use power-driven impact tools.
  2. Locate demolition equipment throughout structure and promptly remove debris to avoid imposing excessive loads on supporting walls, floors, or framing.
  3. Provide services for effective air and water pollution controls as required by local Authorities having Jurisdiction.
  4. Demolish foundation walls to a depth of not less than 12 inches below existing ground surface, or as required for new construction unless noted otherwise on drawings. Demolish and remove below-grade wood or metal construction. Break up below-grade concrete slabs.

5. For interior slabs on grade, use removal methods that will not crack or structurally disturb adjacent slabs or partitions. Use power saw where possible.

- B. If unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to General Contractor and Architect in written, accurate detail. Pending receipt of directive from General Contractor and Architect, rearrange selective demolition schedule as necessary to continue overall job progress without undue delay.

### 3.3 SALVAGED MATERIALS

- A. Salvaged Items: Where indicated on Drawings as "Salvage - Deliver to Owner," carefully remove indicated items, clean, store, and turn over to Owner and obtain receipt.
1. Historic artifacts, including cornerstones and their contents, commemorative plaques and tablets, antiques, and other articles of historic significance, remain property of Owner. Notify Construction Manager if such items are encountered and obtain acceptance regarding method of removal and salvage for Owner.

### 3.4 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove from building site debris, rubbish, and other materials resulting from demolition operations. Transport and legally dispose off site.
1. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.
2. Burning of removed materials is not permitted on project site.

3.5 CLEANUP AND REPAIR

- A. General: Upon completion of demolition work, remove tools, equipment, and demolished materials from site. Remove protections and leave interior areas broom clean.
  - 1. Repair demolition performed in excess of that required. Return elements of construction and surfaces to remain to condition existing prior to start operations. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

END OF SECTION 02070

SECTION 02220 - SITE DEMOLITION

PART 1 - GENERAL

1.1 REGULATORY REQUIREMENTS

- A. Conform to applicable codes for demolition of structures, safety of adjacent structures, dust control, and disposal of materials.
- B. Obtain required permits from authorities.
- C. Notify affected utility companies prior to starting work and comply with their requirements.
- D. Conform to applicable regulatory procedures when discovering hazardous or contaminated materials.
- E. Rules, regulations or laws of any controlling Governmental Agency shall govern, when they are more stringent than the requirements of this Section.

1.2 DESCRIPTION

- A. Provide all labor, materials, and equipment necessary for the completion of all Demolition as shown on the Drawings and specified herein.
- B. All on and offsite Work included consists of but is not limited to:
  - 1. Removal of existing ground mounted building signs, as noted and concrete walks or asphalt pavement where indicated or required for demo and/or new construction of ground mounted building signs.
  - 2. Removal from Site and disposal of all excess and unusable material.

### 1.3 DEFINITIONS

- A. Remove: Remove items from existing construction and legally dispose of them off-site.
- B. Remove and Reinstall: Carefully remove items indicated from existing construction, prepare them for reuse, and reinstall them where indicated. Prior to reinstalling the item, the Contractor shall make a determination as to its soundness. Items which exhibit signs of wear or deterioration shall only be discarded on agreement with the Architect and Owner.
- C. "Remove and Salvage" or indicated "Return to Owner": Remove items from existing construction and deliver them to owner.

### 1.4 QUALITY ASSURANCE

- A. The Contractor shall visit the Site so that a full understanding of the difficulties and restrictions for execution of the Contract are made. Verify the location of all pertinent items. No additional compensation will be allowed for failure to be so informed.
- B. The Contractor shall submit a schedule indicating proposed sequence of operations for selective demolition Work to the Architect and Owner for review prior to commencing Work. Include coordination for shutoff, capping, and continuation of utility services as required, together with details for dust and noise control protection.
- C. Comply with regulatory requirements and notification regulations before beginning selective demolition.
- D. Comply with hauling and disposal regulations of the Authorities Having Jurisdiction. A receipt indicating acceptance of hazardous wastes from a landfill facility licensed to accept such materials shall be submitted to the owner.

1.5 JOB CONDITIONS

- A. Existing structures, utilities, drives, walks, etc., have been shown on the plans in their approximate location, others may exist and may be found upon visiting the site. It shall be the responsibility of the Contractor to accurately locate all facilities and to determine their extent. If such facilities obstruct the progress of the Work and are not indicated to be removed or relocated, they shall be removed or relocated only as directed by the Owner.
- B. Owner assumes no responsibility for the actual condition of items or structures to be demolished.
- C. Protect trees, plants, and natural features which are to remain as final landscaping.
- D. Replace to new conditions any pavement or public right-of-way that is disturbed by the Work under this Section. All pavement replacement work in public rights-of-way shall be performed to the proper satisfaction of the governmental agencies having jurisdiction thereover.
- E. If cutting torches are used, take all necessary precautions to prevent setting of fires, including the use of fireproof tarpaulins and fire extinguishing apparatus adjacent to cutting area.
- F. Notify utility companies if removal or relocation of any existing utilities is required.
- G. Promptly repair damages caused to adjacent facilities by demolition Work.
- H. Do not close, block, or otherwise obstruct access to existing streets, sidewalks, driveways, and other adjacent occupied or used facilities during demolition. Any proposed closures shall have written permission from the authority having jurisdiction.
- I. Maintain existing utilities and protect them against damage during demolition operations.

1. Do not interrupt utilities serving occupied or used facilities, except when authorized in writing by the Authorities Having Jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.
  2. Maintain fire protection services during demolition operations.
- J. Environmental Controls: Use water sprinkling, temporary enclosures, and other methods to limit dust and dirt migration. Comply with governing regulations pertaining to environmental protection.
1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

#### 1.6 DRAINAGE MAINTENANCE

- A. During the entire course of operations, all existing drainage ways, both into and from the Project area shall be maintained in a functional condition.
- B. At all times during the clearing operation, the exposed areas of subgrade shall be maintained in a condition compatible with positive drainage of the Work area. Failure to maintain such drainage shall be considered adequate cause for the Construction Manager to order temporary suspension of the Work.
- C. Cut drainage swales and provide temporary grading to carry storm water away from the demolition area. No water will be permitted to stand in open excavations.

#### PART 2 - PRODUCTS

- A. Use repair materials identical to existing materials. If identical materials are unavailable, use new materials whose performance is equal to or surpasses that of the existing material.

- B. Comply with material and installation requirements specified in the individual sections of this contract.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Locate, identify, and protect all known utilities which are to remain. If utilities are uncovered that are not shown on the plans, notify the owner and cease work in the immediate areas until instructed to how to proceed.
- B. Cease operations and notify the Architect and Owner immediately if safety of structure or adjacent structures appear to be endangered. Take precautions to support structure and **DO NOT** resume operations until a determination is made for continuing operations.
  - 1. Provide bypass connections as necessary to maintain continuity of service to occupied areas of building.
  - 2. Check with the water and sewer departments, Gas Company, and private utility companies to assure that all utilities and services are inoperative prior to their removal (if scheduled).

#### 3.2 DEMOLITION

- A. Perform demolition Work in a systematic manner. Use such methods as required to complete Work indicated on Drawings in accordance with demolition schedule and governing regulations.
  - 1. Concrete pavement shall be sawcut full depth and removed to the joint nearest the indicated removal limit or where specifically directed.
  - 2. Maintain in operating conditions all active utilities, sewers and drains encountered.

3. The Contractor shall use extreme caution in removing any structures and utilities above and below grade to prevent damage to existing utilities which are to remain in service. Any existing utilities to remain, which are in any way damaged, shall be replaced at no additional cost to the Owner.
4. Conduct operations in such a manner as to minimize noise, dust and other disturbances.

### 3.3 DISPOSAL OF DEMOLISHED MATERIALS

A. Demolished material not indicated for turning over to the owner or specified for reuse, including rubble and other debris, shall become the property of the contractor and shall be removed daily from the project site and legally disposed of off the project site, at no expense to the Owner.

1. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.

2. Burning of materials shall not be permitted on Site.

### 3.4 CLEANUP AND REPAIR

A. Upon completion of demolition Work, remove tools, equipment, and demolished materials from Site.

B. Repair demolition performed in excess of that required. Return elements of construction and surfaces to remain to condition existing prior to start of operations. Repair adjacent construction damaged by demolition Work.

END SECTION 02220

SECTION 02860 - SITE AND STREET FURNISHINGS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General and Supplementary conditions and Division 1 Specification Sections apply to this Section.

1.02 DESCRIPTION OF WORK:

- A. Provide all labor, materials, necessary equipment and services to complete the Site Furnishings work, as indicated on the drawings, as specified herein or both, except for items indicated "NIC ITEMS."
- B. Contractor shall provide and install:
  - 1. Concrete Benches
  - 2. Wave Bike Racks
  - 3. Park Benches

1.03 SUBMITTALS:

- A. Manufacturer's Data:
  - 1. Descriptive data of installation, methods, procedures and maintenance.
- B. Complete shop drawings for all items of work under this section indicating all details of fabrication and installation, including sizes, shapes, finishes, colors, thickness, material quality and all other related work applicable to the items of this section.

1.04 DELIVERY, STORAGE AND HANDLING:

- A. Deliver all materials with manufacturer's tags and labels intact.
- B. Store and handle so as to avoid damage.

PART 2 - PRODUCTS

2.01 CONCRETE BENCHES

- A. Acceptable manufacturer for concrete benches:  
Wausau Tile, Model TF5118.
  - 1. Concrete bench
    - a. 36" dia. x 18" h
    - b. Unit weight: 720 lbs.
    - c. Color and finish to be selected by Architect from standard acid wash, premium ground and polished or standard weather stone finishes.
- B. Available at Wausau Tile, Inc. P.O. Box 1520,  
Wausau, WI 54402-1520, 1-800-388-8728.
- C. Provide (6) six Model TF5118 concrete benches.  
Locate as shown on drawings.
  - 1. Provide with all required anchoring inserts.

2.02 WAVE BIKE RACKS

- A. Model H36-9-S-SF 7 loop heavy-duty Challenger Bike Rack, 88-1/8" +/- 1"L x 37" +/- 1/2"H, frame of 2" Schedule 40 (2-3/8" o.d.), tubing of type 304 stainless steel. Accommodates (9) nine bikes per rack with 9-7/8" spacing between loops to allow use of high security u-locks. Provide all mounting accessories for a surface mount application onto concrete. Install per manufacturer's specifications.  
Available from Belson Outdoors Group, 627 Amersale Drive, Naperville, IL 60563, 1-800-323-5664, [sales@belson.com](mailto:sales@belson.com)
  - 1. Provide quantity as indicated on drawings.

2.03 PARK BENCHES

- A. Model 940SM-VG, 6 foot surface mounted park bench with diamond pattern bench seat and back. Seat and back: 12" wide x 72" long. Seat height: 18-1/4", seat back height: 35-3/16", total depth of seat with back: 22-5/16".
1. Seat and back: 11 gauge die formed angle frame, 1" x 1-7/8" with 3" radius corners, 3/4" #9 steel expanded metal, 7 gauge x 1-1/2" flat bar center support and mounted bracket under structure. Electrically mig welded. Seat Color: Blue.
  2. Coating: Oven fused functionalized polyethylene copolymer-based thermoplastic. Fluidized bed coating application with superior mechanical performance, impact resistance and UV-stability.
  3. Frame: 2-3/8" o.d. x 12 gauge pre-galvanized structural steel tubing. Seat/back support is bent over a mandrel through the bend radius producing a wrinkle free bend. Tube ends are pre-galvanized steel capped seat mounting points are 7 gauge x 1-1/2" die stamped steel flat bar. A 6" x 6" steel plate makes up the surface mount footing. The surface mount plate has four holes for stable mounting and clipped corners for a more finished look. All electrically mig welded.
    - a. Frame coating: electrostatic powder coated application, oven cured.
      - i. Frame Color: Matte Black
  4. Hardware: Provide all required hardware in stainless steel finish with optional covers over mounting plates, (2) covers per bench. Install per manufacturer's specifications.
  5. Available from: Belson Outdoors Group, 627 Amersale Drive, Naperville, IL 60563, 1-800-323-5664.
  6. Provide quantity as indicated on Drawings.

3.01 EXAMINATION:

- A. Installer shall examine areas and conditions, with the General Contractor present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION GENERAL:

- A. Comply with manufacturer's written installation instructions, unless more stringent requirements are indicated. Complete field assembly of site furnishings, where required.
- B. Unless otherwise indicated, install site furnishings after paving has been completed.
- C. Install site furnishings level, plumb, true and securely anchored at locations indicated on plans.
- D. Provide complete shop drawings and manufactured cut sheets on all manufactured items.

3.03 WORKMANSHIP AND INSTALLATION:

- A. Provide as indicated and detailed on the drawings, and as per manufacturer's standard printed specifications, instructions and recommendations.
- B. Provide complete shop drawings and manufactured cut sheets on all manufactured items.

3.04 CLEANING

- A. After completing site and street furnishing installation, inspect components. Remove spots, dirt, and debris. Repair damaged finishes to match original finish or replace component.

- 3.05 Provide manufacturer's standard warranty for precast products for the period of two years upon acceptance of products.

END OF SECTION 02860

SECTION 02925 - CLEANUP AND RESTORATION

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The Contractor shall restore areas disturbed by construction activities to a condition reasonably close to their condition before the project, unless shown otherwise on the plans. Restoration work should be performed as soon as possible after construction work is completed in a particular area.
- B. Upon the completion of work in an area, all excess materials, debris, equipment, and similar items shall be removed from the project area by the Contractor, and disposed of properly.

PART 2 - MATERIALS

Not Applicable.

PART 3 - EXECUTION

3.1 RESTORATION

- A. Unless otherwise provided; aggregate surfaces, bituminous pavements, and concrete pavements shall be restored by construction of similar replacement surfaces.
- B. Turf areas shall be restored by re-establishing the turf as described in the Specification Section 02951 "Landscape Restoration". All areas disturbed by construction that are not to be surfaced with aggregate or pavement shall be restored with turf, unless otherwise directed.
- C. Mailboxes, fences, signs, ornaments, and similar items shall be replaced at the completion of construction. Posts shall be installed plumb. Items that are lost or stolen shall be repaired or replaced at the Contractor's expense. Repairs or replacements shall meet the Owner's approval.

3.2 TEMPORARY RESTORATION OF DRIVING SURFACES

- A. Where a pavement or gravel surface is removed as a result of construction activities, a temporary surface shall be provided and maintained by the Contractor until the permanent surface is provided. Unless otherwise directed, the temporary surface shall be twelve inches of aggregate compacted to at least 95 percent of its maximum density (ASTM D1557) and graded to meet the adjacent, remaining surfaces. Aggregate shall meet the requirements of Series 23A as described in the 2012 Michigan Department of Transportation Specifications.
  
- B. The Contractor shall regrade the temporary surface and add additional aggregate at intervals necessary to maintain them in a relatively smooth condition.

END OF SECTION 02925

SECTION 02951 LANDSCAPE RESTORATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Soil Materials and Preparation
- B. Restoration of Lawns (Seeding)
- C. Restoration of Lawns (Sod - Contractor's Option)
- D. Planting Mixes

1.2 REFERENCES

- A. FS O-F-241 - Fertilizers, Mixed, Commercial
- B. American Standard for Nursery Stock ANSI 260.1-2004

1.3 QUALITY ASSURANCE

- A. Provide seed mixture in containers showing percentage of seed mix, year of production, net weight. Date of packaging and location of packaging.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver landscape materials in original, unopened and undamaged containers showing weight, analysis and name of manufacturer. Store in manner to prevent wetting and deterioration.

1.5 COORDINATION

- A. All disturbed areas shall be restored to a condition equal to or greater than the area's condition before the project began (i.e. lawns, trees, plants, shrubs).
- B. Protect existing utilities, paving and other facilities from damage caused by landscaping operations.

- C. Perform restoration work only after sitework has been completed and ground surface will not be affected.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Topsoil: Topsoil shall be free from roots, sticks, weeds, brush or stones larger than 1-in. in diameter or other litter or waste products. It shall be a loamy mixture having at least 90 percent passing a No. 10 sieve. A sample, free from extraneous materials, shall comply to the following requirements:

1. Organic Matter: Topsoil shall contain not less than 10 percent organic matter as determined by the test for organic matter, AASHTO T 194.
2. Clay: The topsoil shall contain not less than 12 percent clay or more than 50 percent as determined in accordance with AASHTO T 88.
3. Sand: The sand content shall not exceed 55 percent as determined in accordance with AASHTO T 88.
4. pH: The pH of the sample shall not be less than 5.0 nor higher than 8.0. The pH shall be determined with an acceptable pH meter, on that portion of the sample passing a No. 10 sieve, in accordance with ASTM D-4972, pH of soils.

B. Supplied or stockpiled topsoil shall be fertile, friable and representative of local productive soil, capable of sustaining vigorous plant growth and screened free of clay lumps, subsoil, noxious weeds or other foreign matter such as stones greater than 1" in diameter in any dimension, roots, sticks and other extraneous materials not frozen or muddy. pH of existing or supplied soil to range between 5.0 and 7.5. Adjusted to not more than 7.0 by additives as required by soil test. Topsoil shall contain not less than 3% and not greater than 10% organic matter. Clay content as determined by Bouyoucos

Hydrometer Test shall range between 5 and 15 percent.  
Mechanical analysis as follows:

PASSING	RETAINED ON	PERCENTAGE
1" Screen		100%
1" Screen	¼" screen (gravel)	Not more than 3%
	¼" Screen	40-60%
	No. 140 USS Mesh Sieve	
	No. 140 USS	30-35%

Percentage based on dry (Very fine weight of the samples sand, silt and clay)

C. If sufficient topsoil is not available at the Site or the Landscape Contractor elects the option to secure topsoil elsewhere, the Landscape Contractor must receive the Owner's approval of material in writing prior to securing topsoil. All topsoil secured off Site must meet other requirements of this Section.

## 2.2 SEED MIXTURES

A. Lawn Seed: Fresh, clean and new crop proportioned by weight as follows:

	MIX	MIN. GERMINATION	MIN. PURITY
Perennial Ryegrass	20%	85%	96%
Kentucky Bluegrass	30%	85%	98%
Creeping Red Fescue	50%	85%	97%

## 2.3 ACCESSORIES

### A. Lawn

1. Wood fiber mulch slurry, 2000 lbs fiber per acre.
2. Fertilizer: Water soluble 20-20-20 composition.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine finish surface and grades. Do not start landscape restoration work until all unsatisfactory conditions are corrected.

### 3.2 PREPARATION OF SUBSOIL

- A. Prepare sub-soil to eliminate uneven areas and low spots. Maintain lines, levels, profiles and contours. Make changes in grade gradual. Blend slopes into level areas.
- B. Remove foreign materials, weeds and undesirable plants and their roots. Remove contaminated sub-soil.

### 3.3 PLACING TOPSOIL

- A. For Trees, Plants and Ground Cover: Spread topsoil to a minimum depth of 6 inches over area to be planted. Rake smooth and free of debris.
- B. For Seeding/Sodding Lawns: Spread topsoil to a depth of 3 inches over area to be seeded/sodded. Rake smooth and free of debris.

### 3.4 HYDROSEEDING

- A. Seeding operations shall take place between March 15 and June 15 under favorable climatic conditions or August 15-September 15.

- B. Treat all grassy or weedy areas with an environmentally friendly weed killer acceptable to the Owner to eliminate existing vegetation. Wait 7-10 days, then apply a second application of the environmentally friendly weed killer and wait another 7 days until planting.
- C. Scarify ground with rake as necessary immediately before sowing seed to provide smooth, even grade and friable seed bed.
- D. Use a hydromulcher (sprayer) and apply mixture(s) at the following rate. Mix in accordance with manufacturer's recommendations.
- E. Apply hydroseed slurry to indicated areas. Use tackifier only on erosion prone areas. Apply fertilizer with hydro mix.

Seed: At specified seeding rates (220 pounds per acre)  
Fertilizer: 300 pounds per acre  
Tackifier: 60 gallons per acre  
Wood Cellulose Fiber Mulch: 2000 pounds per acre

- F. Use care so as not to get hydroseed materials on buildings, walks, roadways, plant beds, etc.

### 3.5 SODDING

- A. Installation of sod shall occur between the dates indicated in the current MDOT standard specifications for construction, unless written authorization is given by the owner or owner's representative.
- B. Sod shall be placed in areas where sod had existed prior to the project beginning.
- C. Stagger sod rolls so that seams alternate. Roll sod to eliminate air pockets.

### 3.6 ACCEPTANCE

- A. Architect shall inspect work upon written request of the Landscape Contractor after completion of 60-day establishment maintenance period.
- B. Acceptance of plant material shall be for conformance to specified size, character, and quality and shall not relieve the Landscape Contractor of responsibility for full conformance to Contract Documents including correct species.
- C. Acceptance in part: Portions of lawns and/or transplantings may be accepted in part upon Architect's approval. Lawn area and/or transplanting may be accepted exclusive of each other in best interest of Owner.
- D. The Landscape Contractor is responsible for watering of hydroseed and sod until acceptance by Architect/Owner.
- E. Establish dense lawn of permanent grasses, free from lumps and depressions. Any area failing to show uniform germination to be reseeded; continue until dense lawn established. Damage to seeded area resulting from erosion to be repaired by the Landscape Contractor. Scattered bare spots less than 5 percent of the total area is acceptable.
- F. In event the Landscape Contractor does not establish dense lawn during germination period, return to project to refertilize and reseed to establish dense lawn.
- G. Should the seeded lawn become largely weeds after germination, the Landscape Contractor is responsible to kill the weeds and reseed the proposed lawn areas to produce a dense turf, as specified.

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3.7 CLEANUP

A. Perform cleaning during installation of the work and upon completion of the work to the approval of the Architect. Remove from site all excess materials, debris and equipment. Repair damage resulting from seeding operations. Clean all areas where overspray has occurred from hydroseeding operations.

END OF SECTION 02951

SECTION 02953 - LANDSCAPE MAINTENANCE AND WARRANTY STANDARDS

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.

1.2 DESCRIPTION OF WORK:

- A. The requirements of this Section include a one year warranty period from date of acceptance of installation.
- B. Related Work Specified Elsewhere:
  - 1. Section 02951: "Landscape Restoration".

1.3 ACCEPTANCE OF INSTALLATION:

- A. At the completion of all landscape installation, or pre-approved portions thereof, the Landscape Contractor shall request in writing an inspection for acceptance of installation in which the Landscape Contractor, Architect/Engineer, General Contractor and Owner shall be present. After this inspection a "Punch List" will be issued by the Architect/Engineer. The Architect/Engineer, General Contractor and Owner shall re-inspect the project and issue a written statement of acceptance of installation and establish the beginning of the project warranty period.
- B. Landscape work may be inspected for acceptance in parts agreeable to General Contractor, Owner and Architect/Engineer provided work offered for inspection is complete, including maintenance as required.
- C. For work to be inspected for partial acceptance, the Landscape Contractor shall provide a drawing outlining work completed, and supply a written statement requesting acceptance of this work completed to date.

1.4 PROJECT WARRANTY:

- A. The project warranty period begins upon written acceptance of the project installation by the Architect/Engineer and Owner.

- B. The Landscape Contractor shall guarantee seeded areas through construction and for a period of one year after date of acceptance of installation against defects including death and unsatisfactory growth, except for defects resulting from neglect by Owner, abuse or damage by others, or unusual phenomena or incidents which are beyond the Landscape Contractor's control.

1.5 MAINTENANCE:

- A. To insure guarantee standards, the following maintenance procedures shall be executed during construction and for the full project warranty period.
- B. Maintenance of Hydro-Seeded Lawn Areas:
1. The Landscape Contractor shall establish a dense lawn of permanent grasses, free from lumps and depressions or any bare spots, none of which is larger than one foot of area up to a maximum of 3% of the total hydro-seeded lawn area. Any part of the hydro-seeded lawn that fails to show a uniform growth and/or germination shall be reseeded until a dense cover is established.
  2. If hydro-seeded in fall or if not considered acceptable at that time, continue maintenance the following spring until acceptable lawn is established.
  3. The Landscape Contractor shall provide a minimum of two cuttings of the lawn or more as necessary until the inspection and acceptance of installation by the Owner and Architect/Engineer. When the lawn reaches 3 inches in height it shall be cut to 2 inches in height. When meadow lawn reaches 6" in height it shall be cut to 4" in height.
  4. The Owner assumes cutting responsibilities following the acceptance of installation by the Owner and the Architect/Engineer.
  5. After acceptance of installation, and for the duration of the project warranty period the Landscape Contractor shall continue all other maintenance procedures including fertilizing and weeding, and other operations such as rolling, regrading, replanting, and applying herbicides, fungicides, insecticides as required to establish a smooth, acceptable lawn free of eroded or bare areas.

6. Repair, rework, and reseed all areas that have washed out, and eroded, or do not substantially germinate.
7. At conclusion of project warranty period and after receiving written final acceptance by Construction Manager, Owner and Architect, the Owner shall assume all seeded lawn maintenance responsibilities.

1.6 FINAL ACCEPTANCE:

- A. At the conclusion of the project warranty period the Landscape Contractor shall request a project inspection for final acceptance in which the Landscape Contractor, Architect/Engineer, General Contractor and Owner shall be present. After this inspection a "Punch List" will be issued by the Architect/Engineer. Upon completion of all punch list items, the Architect/Engineer and Owner shall reinspect the project and issue a written statement of final acceptance. Upon final acceptance the Owner assumes all maintenance responsibilities for the landscape of the project.

PART 2 AND 3 - PRODUCTS AND EXECUTION

Not Applicable.

END OF SECTION 02953

SECTION 03001 - CONCRETE

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 specification.

1.02 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 05500 - Metal Fabrications.

1.03 SUBMITTALS

- A. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures". Indicate reinforcement sizes, spacings, locations, and quantities, bending and cutting schedules, supporting and spacing devices.
- B. See Architectural and Structural 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.

1.04 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).
- F. Standard Practice for Curing Concrete (ACI 308).
- G. Specification 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 as a Mineral Admixture 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 347R).
- 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

2.01 FORM MATERIALS

- A. Form Material for Exposed Concrete: Plywood; 5/8" APA B-B plyform 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).
- 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. 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.

- G. Dovetail Anchor Slots: Galvanized steel, foam filled, release tape sealed slots, bond tab anchors as manufactured by Heckmann, Hohmann & Barnard, Inc. or approved.
- H. Form Release Agent: Colorless mineral oil which will not stain the concrete or impair natural bonding characteristics of coating intended for use on concrete.
- I. 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.
- J. Slab Edge Joint Filler: ASTM D994, premolded asphaltic board, thickness as indicated or (if not indicated, 1/2" thick minimum).
- K. Nails, spikes, lag bolts, through bolts, anchorages: Size as required, of sufficient strength and character to maintain formwork in place while placing concrete.

## 2.02 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 lags 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; Fibermesh, 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.

## 2.03 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 regarding, 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. 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.
  - a. Manufacturer: Dayton Superior Corp. or equal as approved by the Engineer.

I. Adhesive Anchoring: Injectable adhesive or self-contained capsule as manufactured by:

1. 'Hilti' HIT System, or Architect approved/reviewed equal.

#### 2.04 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. Cure/Sealer Interior Exposed Concrete Floors: Curing compound, non-residual or dissipating resin curing compound. Product of sealer manufacturer and meeting sealer manufacturer's requirements. Manufacturers to include:

1. Dayton Superior Corp "Day-Chem Sil-Cure" (J-13).
2. L & M Cure or Cure R.

#### 2.05 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. Footings - 3500 psi. 28-day compressive strength; water-cement ratio, 0.58 maximum (non-air-entrained), 0.46 maximum (air entrained).
  2. All other concrete - 3500 psi. 28-day compressive strength; water-cement ratio, 0.51 maximum (non-air-entrained), 0.40 maximum (air entrained). 4000 psi. 28-day compressive strength; water-cement ratio, 0.44 maximum (non-air entrained).
- C. Slump Limits: Proportion and design mixes to result in concrete slump at the point of placement as follows:
1. Reinforced Foundation Systems: Not less than 1" and not more than 4".
  2. All Other Concrete: Not less than 1" & not more than 4".
  3. Concrete containing high-range water-reducing admixture (superplasticizer). Not more than 8 inches after adding admixture to site-verified 2-3 inch slump concrete.
  4. 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.
- 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, concrete walks, 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

#### 3.01 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 or plumbing piping.
- 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.

3.02 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.

3.03 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.

3.04 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. Separate exterior slabs-on-grade from vertical surfaces with ½ inch thick joint filler, extended full thickness of slab. Also, provide filler strips at supported slabs and other vertical surfaces.
- C. 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.
- D. 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.
- E. Concrete shall be conveyed from the mixer to place of final deposit by methods which will prevent separation and loss of material.
- F. 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.
- G. 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.
- H. 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.

- I. 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.
  - J. 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.
  - K. Where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack with non-shrink grout or chemical adhesive. Follow manufacturer's recommendations for installation.
  - L. Construct all concrete site work items to shape, size, thickness and elevations shown.
  - M. Protecting and sealing: Protect platforms, concrete walks, 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, they 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.
  - N. Provide concrete pads, bases, foundations, etc., as indicated and/or required by mechanical, electrical or other equipment supplier. Set anchor bolts for signage/equipment to templates or measurements provided.
- 3.05 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.

3.06 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 5 days after placement, except high early concrete which shall be cured for at least 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.
  - 3. All concrete materials, all reinforcement, forms, fillers, ground with which concrete is to come in contact shall be free from frost. Whenever temperature of surrounding air is below 40° F., all concrete placed in forms shall have a temperature of between 70° F., 80°F. Adequate means shall be provided for maintaining temperature of not less than 70° F. for 3 days, 50° F. for 5 days, except high-early concrete shall have temperature maintained at not less than 70° F. for 2 days, 50° F. for 3 days, or for as much more time as necessary to insure proper curing. Housing, covering, other protection used in connection with curing shall remain in place at least 24 hours after artificial heating is discontinued. No dependence shall be placed on salt or other chemicals for prevention of freezing.

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.

3.07 CONCRETE FINISHING

- A. Provide concrete surfaces to be left exposed, 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.

3.08 FIELD QUALITY CONTROL

- A. Inspection and testing shall be performed by an independent firm selected and retained by the Owner, in accordance with Division 1, Section 01400 "Quality Control".
- 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, Section 01400 "Quality Control".
- 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. An electronic PDF copy of the 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.
- 3.09 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), will be considered failure of materials and workmanship. Repair of replace toppings in areas of such failures, as directed.

END OF SECTION 03001

SECTION 04100 - MORTAR & GROUT

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 specification. Refer to Structural Drawings for additional information.

1.02 SECTION INCLUDES

- A. Work included in this section consists of furnishing all labor, materials, equipment, and incidentals required for complete installation of mortar and grout for masonry.
- B. Related work specified elsewhere:
  - 1. Section 03001 "Concrete" (Non-shrink grout).

1.03 ENVIRONMENTAL REQUIREMENTS

- A. Recommended Practices for Hot and Cold Weather Masonry Construction as published by the Masonry Industry Council.

PART 2. PRODUCTS

2.01 MATERIALS

- A. Portland Cement: ASTM C150, Type 1 provide natural color or white cement as required to provide mortar color indicated.
- B. Mortar Aggregate: ASTM C144, standard masonry type.
- C. Hydrated Lime: ASTM C207, Type 'S', or 'N'.
- D. Masonry Cement: ASTM C91.
- E. Premix Mortar: ASTM C387.
- F. Grout Aggregate: ASTM C404.
- G. Grout Fine Aggregate: ASTM C144, 100% passing #8 sieve, maximum 5-30% passing #50 sieve.

- H. Water: Clean and potable.
- I. Integral water repellent additive meeting ASTM E-514.
- J. Plasticizer:
  - 1. SIKA Chemical Corporation "Intraplast Z".
  - 2. Euclid Chemical Co. "Eucon BK-S".
- K. Storage of all material shall prevent the intrusion of foreign matter. Store all masonry units on the ground, protected against damage and intrusion of excess moisture. No damaged or deteriorated materials shall be used.

## 2.02 MORTAR MIXES

- A. Mortar for exterior load bearing walls and all exterior masonry work below grade; ASTM C270, Type 'M' or 'S', using the property method unless noted otherwise on structural drawings. Use ASTM C270 Type 'N' above grade at exterior veneers.
- B. Mortar for interior non-load bearing walls and partitions: ASTM C270, Type 'M' or 'S', using the property method.
- C. Mortar for reinforced masonry ASTM C270, Type 'S', using the property method.
- D. Pointing mortar for masonry veneers ASTM C270, Type 'N', using the property method.
- E. Mortar Pigments: Natural and synthetic milled, blended iron oxides, compounded for use in mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortars.
  - 1. Provide colored mortar pigments: Mortar color to be SGS 92H Iron Black. Provide sample for final approval by Architect/Owner as manufactured by Solomon Colors, Springfield, IL 800-624-0261.
    - a. Carbon added for darker colors shall not exceed 4%.
    - b. Mix shall produce uniform and consistent color.

- c. Inert, stable to atmospheric conditions, sun fast, weather resistant, alkali resistant, water insoluble, lime proof and non bleeding.
  - d. Free of deleterious fillers and extenders.
  - e. Practice size: 95 to 99% minus 325 mesh.
  - f. pH: 6.5 to 9.0.
  - g. Shall be tested per ASTM C91 and ASTM C270. Exceed 1800 psi at 28 days strength requirement.
- F. Ready-Mixed Mortar: Cementitious materials, water, and aggregate complying with requirements specified in this Article; combined with set-controlling admixtures to produce a ready-mixed mortar complying with ASTM C 1142.
- G. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494, Type C, and recommended by the manufacturer for use in masonry mortar of composition indicated.

#### 2.03 MORTAR MIXING

- A. Thoroughly mix mortar ingredients in approved type mixing machine in quantities needed for immediate use in accordance with ASTM C270 or C780. Discharge mixer completely before recharging.
- B. All exterior above grade mortar and/or interior mortar exposed to moisture shall be fabricated with integral water repellent additive.
- C. Blend admixtures in accordance with manufacturer's instructions.
- D. Do not use anti-freeze compounds to lower the freezing point of mortar.

#### 2.04 GROUT MIXES

- A. Bond beams, lintels, engineered masonry, reinforced masonry walls: min. 3000 psi strength at 28 days unless noted otherwise; 8-10 inches slump; pre-mixed grout in accordance with ASTM C94, or batch mixed in accordance with ASTM C476 for fine or course grout.

PART 3. EXECUTION

3.01 EXAMINATION AND PREPARATION

- A. Apply bonding agent to existing concrete surfaces.

3.02 INSTALLATION

- A. Install pre-mix mortar and grout in accordance with manufacturer's instructions.
- B. Work grout into masonry cores and cavities to eliminate voids. Do not displace reinforcement. Reinforcing shall be mechanically anchored in masonry cores to prevent displacement during grouting.

END OF SECTION 04100

SECTION 04300 - UNIT MASONRY

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 specification.

1.02 SECTION INCLUDES

- A. Work included in this section consists of furnishing all labor, materials, equipment and incidentals required for complete installation of concrete masonry including tuckpointing and repair of existing SGFT and CMU including installation of reinforcement, anchorage and accessories.
- B. Related work specified elsewhere:
  - 1. Section 04100 - Mortar & grout.
  - 2. Section 07175 - Water Repellant Coatings

1.03 PERFORMANCE REQUIREMENTS

- A. Provide unit masonry that develops the following installed compressive strengths (f'm) at 28 days.
  - 1. For concrete Unit Masonry: As follows, based on net area:
    - a. f'm = 1900 psi (13.05 MPa).
  - 2. For brick unit masonry: As follows, based on gross area
    - a. f'm = 1500 psi (10.3 MPa).

1.04 SUBMITTALS

- A. Provide data on concrete masonry units including proposed reinforcing.
- B. Shop drawing for stone trim including cutting and setting diagrams.
- C. If specifically requested by the Architect/Engineer, provide samples for verification as follows:

1. Full-size units for each different exposed masonry unit required showing the full range of exposed colors, textures, and dimensions to be expected in the completed construction.
2. Weep vents in color to match mortar color.
3. Accessories embedded in the masonry.

1.05 QUALITY ASSURANCE

- A. Fire-Resistance Ratings: Where indicated, provide materials and construction identical to those of assemblies with fire resistance ratings determined per ASTM E 119 by a testing and inspecting agency, by equivalent concrete masonry thickness, or by another means, as acceptable to authorities having jurisdiction.
- B. Single-Source Responsibility for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one source and by a single manufacturer for each different product required.
- C. Single-Source Responsibility for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Hot and Cold weather requirements: Recommended Practices for Hot or Cold Weather Masonry Construction as published by the Masonry Industry Council.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not install until they are in an air-dried condition.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location.

- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

## PART 2. PRODUCTS

### 2.01 CONCRETE MASONRY UNITS

- A. Concrete block (CMU): ASTM C90, normal weight ( $\geq 125$  pcf). Use for above and below grade, exterior or interior wall applications.
  - 1. Texture of exposed faces of block shall be uniform for all block used in this project. Solid units may be used for bearing under structural members. No units with exposed chipped surfaces will be permitted in areas where exposed.
  - 2. Provide shapes such as special units at pilaster blocks, bullnose all external corners, sash recesses, square ends, lintel blocks and other, as required by drawings or specifications.
- B. Split face Masonry Units with Krete
  - 1. Standards: Units shall be normal weight block, withstanding compression test loads of at least 3,000 p.s.i. for individual units, or 3,500 p.s.i. for an average of five units, basing load figures on the average net area of the blocks. Units shall meet or exceed requirements specified for Type I, ASTM C55-97A.
  - 2. Manufacturer: Units specified herein are based on those manufactured by Fendt Products, Farmington Hills, Michigan, Phone: 1-248-474-3211. The same manufacturer shall produce all visually related block.
  - 3. Finish: Splitface units are to be selected from colors using natural dense aggregates including those with white cement/white aggregate. Samples shall be submitted for establishing an approved range of color variation and texture. Color: Light Grey #205.

4. Shape: Splitface Block shall conform to Fendt Products series full face split, Standard pattern as detailed.

## 2.02 REINFORCEMENT AND ANCHORAGE

- A. All single wythe joint reinforcement shall be ladder type wire reinforcing consisting of No. 9 gauge deformed side rods, with No. 9 gauge standard ladder type cross rods. All rods shall be hot-dip galvanized using ASTM A153, Class B-2 standards. Out to out spacing of side rods shall be approximately 2" less than the nominal wall thickness. Provide pre-fabricated corners and tee units as required.
- B. All multiple wythe/cavity wall joint reinforcement shall be adjustable ladder type hot-dip galvanized in accordance with ASTM A153, Class B-2 standards. Separate adjustable ties extend to engage outer wythe by at least 2" and spaced not more than 16" o.c.
  1. Use where horizontal joints of facing wythe do not align with those of back-up and where indicated.
  2. Use where facing wythe is of different material than back-up wythe.
- C. For anchorage to steel framing, provide manufacturer's standard anchors with crimped 1/4 inch (6.4 mm) diameter wire anchor section for welding to steel and triangular-shaped wire tie section sized to extend within 1 inch (25 mm) of masonry face and wire diameter of 0.25". Provide one tie on each side of framing where masonry abuts. Ties to be spaced at 16" o.c. vertical
- D. Adjustable Steel Wire Wall Ties (For Veneer w/CMU Backup): Formed wire 3/16" diameter high tensile, cold drawn steel wire conforming to ASTM A82, galvanized zinc coated finish, installed at 16" o.c. vertical opposite ladder reinforcing. Provide one tie per 2.66 square feet of wall area minimum.

E. Manufacturers:

1. AA Wire Products Co.
2. Dur-O-Wal.
3. National Wire.
4. Hohmann and Barnard, Inc.
5. Wire Bond
6. Other Architect Approved.

F. Reinforcing Steel: ASTM A615, 60-ksi-yield grade deformed steel bars unprotected finish.

2.03 FLASHINGS

A. Through-Wall Flashings: Rubberized asphalt sheet membrane dampproof coursing/wall flashing material, 40 mil thick as manufactured by W.R. Grace & Company "Perm-A-Barrier", including bituthene mastic for sealing joints, terminations and penetrations.

2.04 ACCESSORIES

A. Building Paper: 15# asphalt saturated felt.

B. Column Wrap: Waxed corrugated cardboard or 15# asphalt saturated felt.

C. Weep Vents: Plastic Weep Vent: One-piece, flexible extrusion manufactured from ultraviolet-resistant polypropylene copolymer, designed to weep moisture in masonry cavity to exterior, sized to fill head joints with outside face held back 1/8 inch from exterior face of masonry, in color selected from manufacturer's standard.

D. Cavity Drainage Material: 1-inch (25 mm) thick, reticulated, nonabsorbent mesh, made from polyethylene strands and shaped to maintain drainage at weep holes without being clogged by mortar droppings.

1. Product: Subject to compliance with requirements, provide "Mortar Net" by Mortar Net USA, Ltd or Architect approved.

PART 3. EXECUTION

3.01 EXAMINATION AND PREPARATION

- A. Verify that field conditions are acceptable and ready to receive work. Examine rough-in and built-in construction to verify locations prior to installation.
- B. Coordinate placement of anchors supplied to other sections.
- C. Employ skilled mechanics, experienced supervision. Lay masonry plumb, true to line, with level, accurately spaced courses. Break vertical joints unless otherwise indicated. Keep bond plumb. Rack courses, where necessary, without toothing. Lay out facing before setting, minimize cutting closures, jumping bond.
- D. Do not wet concrete masonry. Lay masonry with complete bearing in full beds of mortar. Butter sides for full vertical joints. Shove units into place. Anchor walls not otherwise bonded with ties every 8", every four (4) courses.
- E. Cover top of masonry work at end of day's work with reinforced waterproof non-staining membrane. When air temperature is below 40°F., heat masonry materials, provide cold weather protection necessary to maintain temperature from 40°F. for 48 hours, both sides of masonry.
- F. Mix units for exposed unit masonry from several pallets as they are placed to provide a uniform blend of colors and textures.

3.02 COURSING

- A. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness. Lay out walls in advance for accurate spacing of openings, movement type joints, returns, etc. Avoid units of less than half size at corners and jambs.

- B. Block unit shall be laid in stack or running bond, as indicated on drawings with vertical joints aligned plumb, horizontal joints level. Joints in back-up work shall be worked out to provide bonding with facing masonry. Joints shall be uniform in width, thickness not to exceed 1/3". Exposed joints in finish work shall be tooled slightly concave, others shall be cut flush.
- C. Initial block course (first course above foundation) in walls (exterior) shall be laid in full mortar beds on shells and cross webs; in other locations, units shall be laid in full mortar beds on shells only. Solid block units shall be laid same as brick. Vertical joints between units shall be filled with mortar between shell ends.
- D. Provide welded steel masonry reinforcing placed in every second horizontal course in all block walls. Lay reinforcing on wall and cover with mortar, bed unit as usual. Longitudinal wire shall be lapped not less than 32 diameters at splices. At corners, cut inside rod and bend to proper angle.
- E. Construct bond beams as indicated with concrete grout. Maintain accurate location of reinforcing steel during grout placement.
- F. Grout course solid (or use solid units immediately below locations where masonry serves as a support for a sign).
- G. Stopping and Resuming Work: In each course, rack back 1/2-unit length for one-half running bond or 1/3-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry and remove loose masonry units and mortar prior to laying fresh masonry.

### 3.03 WEEPS AND VENTS

- A. Install weep holes in veneer at 24" on center horizontally or as indicated on drawings above through-wall flashing, above shelf angles, and at bottom of walls. Weeps shall be laid with masonry. Weep holes shall not be drilled, cut or carved into mortar joints.

3.04 CAVITY WALL

- A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep holes. Provide layer of clean mason's sand at base of cavity directly on through wall flashing of sufficient depth to cover weep holes.
- B. Build inner wythe ahead of outer wythe to receive cavity insulation air/vapor barrier adhesive.
- C. Tie exterior wythe to back-up with continuous horizontal joint reinforcing.

3.05 REINFORCEMENT & ANCHORAGES - SINGLE WYTHE MASONRY

- A. Walls laid up with concrete block, including where used as back-up shall be reinforced with horizontal steel wall reinforcing as specified. Reinforcing shall be of proper width for block wythe, to have side wires over block shells. Place joint reinforcement at 16" o.c. vertical and continuous in first and second joint below top of walls.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum of 3'-0" beyond each side of opening.
- C. Reinforcing in foundation walls (below floor slab) shall be placed every other course, continuous.
- D. Terminate reinforcing each side of control joints; lap end joints 12", form corners by cutting and lapping inside wire, bending outside wire; form intersections by cutting and lapping reinforcing from one wall with other wall. Bed side wires completely in mortar.

3.06 REINFORCEMENT & ANCHORAGES - CAVITY WALL MASONRY

- A. Install horizontal joint reinforcement 16 inches o.c. vertically. Place joint reinforcement continuous in first joint below top of walls.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

3.07 MASONRY FLASHINGS

- A. Extend flashings under, over and through veneer. Turn up minimum 8 inches and bed into mortar joint of backup masonry.
- B. Lap end joints and seal watertight.
- C. All discontinuous flashing shall be turned up one head joint past the opening jamb to form an end dam.
- D. Use flashing manufacturer's recommended adhesive and sealer.

3.08 GROUTED COMPONENTS

- A. Reinforce bond beam and pilasters as detailed.
- B. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.
- C. Place and consolidate grout fill without displacing reinforcing.
- D. At beam bearing locations, fill masonry cores with grout for a minimum 12 inches either side of member and three courses vertical, unless otherwise noted.

3.09 ENGINEERED MASONRY

- A. Lay masonry units with core cells vertically aligned and cavities between wythes clear of mortar and unobstructed.
- B. Reinforce masonry unit cores and cavities with reinforcement bars and grout as indicated. Provide vertical bars in corners. Provide vertical bars at each side of all masonry openings. Vertical bars to continue at noted spacing above openings.
- C. Secure vertical reinforcement in position at top and bottom of cells and at intervals not exceeding 192 bar diameters. Splice reinforcement 48 bar diameters, minimum 12".

- D. Place mortar in masonry unit bed joints back 1/4 inch from edge of unit grout spaces; bevel back and upward. Permit mortar to cure 3 days before placing grout.
- E. Grout spaces less than 2 inches in width with fine grout using low lift grouting techniques. Grout spaces 2 inches or greater in width with coarse grout using high or low lift grouting techniques.
- F. When grouting is stopped for more than one hour, terminate grout 1-1/2 inch below top of upper masonry unit to form a positive key for subsequent grout placement.
- G. Low Lift Grouting: Place first lift of grout to a height of 60 inches maximum and consolidate by mechanical vibration. Place subsequent lifts in maximum 60 inch increments and vibrate grout for consolidation. Ensure mortar has gained sufficient strength to withstand pressure prior to grouting. "Puddling" may be used in lieu of mechanical vibration if grout lifts are limited to 12 inches maximum.

### 3.10 BUILT-IN WORK

- A. As Work progresses, fabricated metal frames, wood nailing strips, anchor bolts, plates, and other items to be built in the Work furnished by other Sections.

### 3.11 POINTING AND CLEANING

- A. Point up all exposed CMU and brick where required, fill all holes and joints; remove loose mortar, cut out defective joints, and repoint where necessary.

### 3.12 TOLERANCES

- A. Maximum Variation from Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Variation from Level Coursing: 1/8 inch in 3 ft. and 1/4 inch in 10 ft.; 1/2 inch in 30 ft.

3.13 CUTTING AND FITTING

- A. Cut and fit for chases, pipes, conduit, sleeves, grounds, and other items. Coordinate with other Sections of Work to provide correct size, shape, and location.
- B. Form slots, grooves, chases, recesses, other items required for other trades. Build in all required structural steel, miscellaneous metal, frame anchors and other items. Bed in mortar to line and level. Check all requirements in advance to eliminate cutting.
- C. Do necessary cutting of masonry for installation of items not otherwise provided for. Patch walls, maintain structural stability, appearance, weather resistance.
- D. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining construction. Use full-size units without cutting, where possible. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

3.14 REPAIRING, POINTING AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units; install in fresh mortar or grout, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point-up joints, including corners, opening, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for application of sealants.
- C. Remove excess mortar and mortar smears.
- D. Clean soiled surfaces with cleaning solution.

- E. On completion of pointing and re-pointing of all face brick and block work, clean thoroughly with "Sure Klean 600", "Craft Klean"(for split face units, clean with custom masonry cleaner by Prosoco) or similar prepared detergent, applied strictly according to the manufacturer's instructions with stiff fiber brushes. Drench with clean water immediately after cleaning. Do not use job mixed acid on this project. All cleaning shall be done prior to installation of any finished floor, wall mounted light fixtures, aluminum frames or items subject to damage. Protect hollow metal frames, aluminum frames, other built-in items.
  
- F. For cleaning pre-faced units, use masonry detergent cleaners in accordance with manufacturer's directions. Do not use hydrochloric acids or other unbuffered acids. Do not use steel wool or other abrasives.

3.15 MASONRY WASTE DISPOSAL

- A. Recycling: Undamaged, excess masonry materials are Contractor's property and shall be removed from the Project site for his use.

END OF SECTION

SECTION 04720 - CAST STONE

PART 1 - GENERAL

1.01 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

1.02 RELATED SECTIONS:

- A. Section 04100 - Mortar & Grout
- B. Section 04300 - Unit Masonry
- C. Section 07910 - Joint Fillers and Gaskets
- D. Section 07920 - Sealants and Caulking

1.03 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.)

1.04 DEFINITIONS:

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

1.05 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.

1.06 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.

1.07 DELIVERY, STORAGE AND HANDLING

A. Delivery:

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.

1.08 SCHEDULING

A. Schedule and coordinate production and delivery of cast stone units with unit masonry work.

PART 2 - PRODUCTS

2.01 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](http://www.rockcast.com). E-mail: info@rockcast.com
- B. Custom Cast Stone Inc., 734 E. 169<sup>th</sup> Street, Westfield, Indiana 46074, toll free (888)776-9960 phone (317)896-1700 Fax (317)896-1701
- C. Custom Stone Works, 32910 Plymouth Road, Livonia, MI 48150 Phone:(734) 427-8158 Fax:(734) 427-8178 Toll free:(877)40-GRANITE.
- D. Superior Precast Products, 1950 Ravine Road, Kalamazoo, MI 49004 Phone: 269-344-7690, Fax: 269-344-7693
- E. Or Equal as approved by Architect/Owner.

2.02 CUSTOM CAST STONE UNITS

- A. Compliance: ASTM C 1364.
- B. Casting Method: Vibrant dry hand tamp.
- C. Texture: Smooth.
- D. Color: Based on Superior Precast Products. Light Grey #205.
- E. Units: As indicated on drawings.
- F. Profiles: As indicated on drawings.
- G. 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.
- H. 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.
- I. Cast Stone type units, as indicated on drawings.

2.03 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.
- F. Water: Potable.
- G. Reinforcing Bars: ASTM A 615, deformed steel bars. Galvanized when covered with less than 1 ½ inches of material.
  - 1. Galvanized Coating: ASTM A 767

2.04 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.

2.05 MORTAR

- A. Mortar: ASTM C 270, Type N, as specified in Section 04100 Mortar & Grout.

2.06 ACCESSORIES

- A. Anchors: Type 304 stainless steel.
- B. Sealant: As specified in Section 07920 "Sealants & Caulking".
- C. Cleaner: Prosoco Sure Klean 600 Detergent, or Prosoco Sure Klean Vana Trol as required per brick type.

2.07 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.

2.08 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.

2.09 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.
  - 1. Custom Cast Stone Units: Test in accordance with ASTM C 1194 and C 1195.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine construction to receive cast stone units. Notify 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.

3.02 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".
  - 2. Prime ends of cast stone units, insert properly sized backing rod, and install sealant.
  - 3. Provide sealant joints at following locations:
    - a. Cast stone units with exposed tops.
    - b. Joints at relieving angles.
    - c. Control and expansion joints.
    - d. As indicated on the drawings.

### 3.03 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.

### 3.04 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.
  - 2. Power washing.
  - 3. Sandblasting.
  - 4. Harsh cleaning materials or methods that would damage or discolor surfaces.

3.05 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.

3.06 INSPECTION AND ACCEPTANCE

- A. Inspect completed installation in accordance with Cast Stone Institute Technical Manual.

3.07 PROTECTION

- A. Protect installed cast stone from splashing, stains, mortar, and other damage.

END OF SECTION 04720

SECTION 05500 - METAL FABRICATIONS

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 specification.

1.02 SECTION INCLUDES

- A. Work included in this section consists of furnishing all labor, materials, equipment and incidentals required for complete installation of miscellaneous metal work shown on the drawings, as specified herein, and/or as needed for a complete and proper installation whether shown or not.

1.03 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.
- B. Perform shop and/or field welding required in connection with the work of this Section in strict accordance with pertinent recommendations of the American Welding Society.
- C. Fabricator Qualifications: Firm experienced in producing metal fabrications similar to those indicated for this project with a record of successful in-service performance, and with sufficient production capacity to produce required units without delaying the work.
- D. Welding Standards: Comply with applicable provisions of AWS D1.1 "Structural Welding Code-Steel," AWS D1.2 "Structural Welding Code-Aluminum," and AWS D1.3 "Structural Welding Code-Sheet Steel."
  - 1. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

1.04 SUBMITTALS

- A. Comply with pertinent provisions of Division 1.
- B. Product Data: Within (35) calendar days after the contractor has received the Owner's Notice to Proceed, submit:
  - 1. Shop drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this section with the work of adjacent trades. Provide templates for anchors and bolts specified for installation under other sections.

1.05 PROJECT CONDITIONS

- A. Field Measurements: Check Actual locations of walls and other construction to which metal fabrications must fit by accurate field measurements before fabrication. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the work.
  - 1. Where field measurements cannot be made without delaying the work, guarantee dimensions and proceed with fabricating products without field measurements. Coordinate construction to ensure that actual dimensions correspond to guaranteed dimensions. Allow for trimming and fitting.

PART 2. PRODUCTS

2.01 MATERIALS

- A. In fabricating items which will be exposed to view, limit materials to those which are free from surface blemishes, pitting, rolled trade names, and roughness.
- B. Comply with following standards as pertinent:
  - 1. Steel plates, shapes and bars: ASTM A36.
  - 2. Steel plates to be bent or cold-formed: ASTM A283, Grade C.
  - 3. Steel tubing (hot-formed, welded, or seamless): ASTM A501 or ASTM A500.
  - 4. Cold-finished steel bars: ASTM A108.

5. Cold-rolled carbon steel sheets: ASTM A336.
6. Galvanized carbon steel sheets: ASTM A526, with G90 zinc coating in accordance with ASTM A525.
7. Steel pipe: ASTM A53, Grade B, standard weight, black finish unless otherwise noted.
8. For exterior installations and where indicated, provide members with hot-dip galvanizing coat per ASTM A53.
9. Concrete inserts:
  - a. Threaded or wedge type galvanized ferrous castings of malleable iron complying with ASTM A27.
  - b. Provide required bolts, shims, and washers, hot-dip galvanized in accordance with ASTM A153.

## 2.02 FASTENERS

### A. General:

1. For exterior use and where built into exterior walls, provide zinc-coated fasteners.
2. Provide fasteners of type, grade, and class required for the particular use.

### B. Comply with following standards as pertinent:

1. Bolts and nuts: Provide hexagon-head regular type complying with ASTM A307, Grade A.
2. Lag bolts: Provide square-head type complying with Fed. Spec. FF-B-561.
3. Machine screws: Provide cadmium plated steel type complying with Fed. Spec. FF-S-111.
4. Washers:
  - a. Plain washers: Comply with Fed. Spec. FF-W-92, round, carbon steel.
  - b. Lock washers: Comply with Fed. Spec. FF-W-84, helical spring type carbon steel.
5. Toggle bolts: Provide type, class and style needed but complying with Fed. Spec. FF-B-588.
6. Anchorage devices: Provide expansion shield complying with Fed. Spec. FF-S-325.

## 2.03 OTHER MATERIALS

- ### A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by contractor subject to the approval of the Architect.

2.04 SHOP PAINT

- A. Primer: Use "10-99 Tnemec Primer" or Architect/Engineered equal product by Rustoleum.
- B. For repair of galvanizing, use a high zinc-dust content paint complying with SSPC-paint 20. Dry film containing not less than 94 percent zinc dust by weight.
- C. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12, except containing no asbestos fibers.

2.05 FABRICATION

- A. Except as otherwise shown on the drawings or the approved shop drawings, use materials of size, thickness, and type required to produce reasonable strength and durability in the work of this Section.
- B. Fabricate with accurate angles and surfaces which are true to the required lines and levels, grinding exposed welds smooth and flush, forming exposed connections with hairline joints, and using concealed fasteners wherever possible.
- C. Prior to shop painting or priming, properly clean metal surfaces as required for the applied finish and for the proposed use of the items.
- D. On surfaces inaccessible after assembly or erection, apply two coats of the specified primer. Change color of second coat to distinguish it from the first.
- E. Shear and punch metals cleanly and accurately. Remove burrs.
- F. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- G. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

2.06 MISCELLANEOUS METAL FABRICATIONS

A. Rough Hardware:

1. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing and supporting woodwork and for anchoring or securing woodwork to concrete or other structures. Straight bolts and other stock rough hardware items are specified in Section 06100 "Carpentry".
2. Manufacture or fabricate items of sizes, shapes, and dimensions required. Furnish malleable iron washers for heads and nuts which bear on wood structural connections; elsewhere, furnish steel washers.

B. Loose Bearing and Leveling Plates:

1. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction made flat, free from warps or twists, and of required thickness and bearing area. Drill plates to receive anchor bolts and for grouting as required. Galvanize after fabrication.

C. Miscellaneous Framing and Supports:

1. Provide miscellaneous steel framing and supports as required to complete work.
2. Fabricate miscellaneous units to sizes, shapes, and profiles shown or, if not shown, or required dimensions to receive adjacent other work to be retained by framing. Except as otherwise shown, fabricate from structural steel shapes, plates, and steel bars of welded construction using metered joints for field connection. Cut, drill and tap units to receive hardware and similar items.
3. Hot dip galvanize exterior miscellaneous frames and supports.

PART 3. EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this section will be performed and notify the General Contractor, in writing, of conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.02 COORDINATION

- A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

3.03 INSTALLATION

A. General:

1. Set work accurately into position, plumb, level, true and free from rack.
2. Anchor firmly into position.
3. Where field welding is required, comply with AWS recommended procedures of manual-shielded metal-arc welding for appearance and quality of weld and for methods to be used in correcting welding work.
4. Grind exposed welds smooth and touch up shop prime coats.
5. Do not cut, weld, or abrade surfaces which have been hot-dip galvanized after fabrication and which are intended for bolted or screwed field connections.

- B. Immediately after erection, clean the field welds, bolted connections and abraded areas of shop priming. Paint the exposed areas with same material used for shop priming.

END OF SECTION 05500

SECTION 07175 - WATER REPELLENT COATINGS

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 specification.

1.02 SECTION INCLUDES

- A. Work included in this Section consists of furnishing all labor, materials, equipment, and incidentals required for complete installation of water repellent coatings including clear sealer and all associated accessories mentioned or scheduled on the drawings and/or herein.

1.03 RELATED WORK

- A. Mortar and Masonry Grout                      04100
- B. Unit Masonry    04300
- C. Joint Sealers    07900

1.04 SYSTEM DESCRIPTION

- A. The exterior coating system shall consist of a liquid-applied, one or two application clear natural looking water repellent sealer.

1.05 QUALITY ASSURANCE

- A. Installation: Applicator of water repellent coating system shall be certified by the manufacturer. Copy of certification shall be submitted with shop drawings.
- B. Application: Test a small area of surface before starting general application to assure desired results and coverage rates. Clear Sealer shall be applied in accordance with manufacturer's written instructions. Apply sealer in two coats with use of recommended spray equipment.

1.06 WARRANTY REQUIREMENTS

- A. Provide ten year warranty under provisions of Division 1, ensuring the water repellent performance of the system from date of acceptance. Provisions of the warranty shall include responsibility for water penetration through peeling and flaking of the coating film.

1.07 SUBMITTALS

- A. Refer to Division 1, General Requirements, for submission procedures.
- B. Submit two samples of brick masonry units with finished product applied. Brick masonry shall be from actual units for use on this project. Examination of samples will be for color change only.
- C. Provide four (4) copies of manufacturer's product data including installation/application instructions.

1.08 PRODUCT HANDLING

- A. Materials shall be delivered to site in original manufacturer's sealed containers.
- B. Materials shall be stored off the ground and in such a manner as to prevent any damage to containers and protect from freezing temperatures.
- C. Sealer shall be thoroughly stirred before and occasionally during use per manufacturer's written instructions.

1.09 ENVIRONMENTAL REQUIREMENTS

- A. Maintain temperatures above 50°F. 24 hours prior to application and continuously until sealer has completely dried.
- B. Do not apply sealer if rain is expected within 24 hours of application.

PART 2. PRODUCTS

2.01 MATERIALS

A. Manufacturers:

1. Hydrozo, Inc., Clear Double 7.
2. Tamms Industries Co., Chemstop Regular.
3. Other architect approved.

B. Coatings: Ready mixed, of good flow, spray and brushing properties, capable of drying or curing free of streaks or sags. Materials shall be resistant to fade and efflorescence.

C. Finish: Natural looking, non-textured, clear.

PART 3. EXECUTION

3.01 EXAMINATION & PREPARATION

A. Verify that substrate conditions and related work performed under other sections are acceptable for installation of work by this trade. Notify Architect in writing of substrate conditions not acceptable for proper application of water repellent coating system.

B. Loose mortar shall be repointed.

C. Efflorescence shall be cleaned from surface and neutralized with product compatible with water repellent coating system.

D. Concrete/masonry shall be dry; mortar and caulking fully cured prior to application.

E. Mask all areas and items adjacent to areas to be coated, including EIFS, aluminum, wood, glass, shrubs, topsoil and horizontal concrete.

3.02 APPLICATION

A. Clear Sealer:

1. Surface receiving sealer must be dry per recommendations of sealer manufacturer.
2. Apply sealer by flooding the surface using manufacturer approved equipment and techniques. Allow excess material to run down a minimum of 12 inches. Follow-up brushing or rolling shall be performed when required by the manufacturer.
3. If required by the manufacturer per conditions encountered, apply second coat 24 hours after the first coat at normal drying conditions.
4. Coverage rates shall be manufacturer's required rates for brick masonry.

3.03 CLEANING

- A. Remove masking from all areas. Mop up puddles from all horizontal surfaces prior to removing masking; do not allow material to runoff masking onto adjacent surfaces.
- B. Clean all areas of splash or overspray per manufacturer's written instructions. Under no circumstances shall product be allowed to dry on surfaces not scheduled to receive the water repellent coating system.
- C. Promptly remove and properly dispose of all empty containers, masking and disposable applicators. Remove all equipment and staging as soon as practicable from job site.

3.04 SCHEDULE

- A. All exposed concrete masonry of new construction.
- B. All exposed poured concrete, including retaining walls and other vertical concrete surfaces of new construction (do not apply to flat concrete work; i.e. walks and slabs).

END OF SECTION

SECTION 07840 - FIRESTOPPING

PART I - 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. Provide labor and materials necessary for complete installation of firestopping materials and systems. Section includes firestopping for the following:
  - 1. Penetrations through fire resistance rated floor and roof construction including both empty openings and openings containing cables, pipes, ducts, conduits, and other penetrating items.
  - 2. Penetrations through fire resistance rated walls and partitions including both empty openings and openings containing cables, pipes, ducts, conduits and other penetrating items.
  - 3. Penetrations through smoke barriers and construction enclosing compartmentalized area involving both empty openings and openings containing penetrating items.
  - 4. Sealant joints in fire resistance rated construction.

1.03 SUBMITTALS:

- A. Product Data: Manufacturer's specifications and technical data for each material including the composition and limitations, documentation of UL or other nationally recognized independent testing laboratories firestop systems to be used and manufacturer's installation instructions.
  - 1. Submit material safety data sheets (MSDS) provided with product delivered to jobsite.

- B. Product certificates signed by manufacturers of firestopping products certifying that their products and installation comply with specified requirements. Certification shall be signed by the Installer.

1.04 QUALITY ASSURANCE:

- A. Conform to applicable governing codes, including local governing authorities, but not limited to the following:
  - 1. NFPA 101 2012 Life Safety Code
  - 2. 2015 Michigan Building Code
- B. Meet requirements of ASTM E814 or UL 1479 tested assemblies that provide a fire rating equal to that of construction being penetrated and other ASTM Standards as applicable for the installation.
  - 1. ASTM E84 "Test Method for Surface Burning Characteristics of Building Materials".
  - 2. ASTM E119 "Test Methods for Fire Tests of Building Construction and Materials".

PARTS 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with through-penetration firestop systems (XHEZ) listed in Volume II of the UL Fire Resistance Directory, provide products by one of the following:
  - 1. Hilti Construction Chemicals, Tulsa, OK
  - 2. Specified Technologies Inc. (STI) Sommerville, NJ
  - 3. 3M Fire Protection Products, St. Paul, MN
  - 4. The Rectorseal Corp., Houston, TX
  - 5. Tremco, Inc. Beachwood, OH

2.02 FIRESTOPPING, GENERAL

- A. Compatibility: Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by firestopping manufacturer based on testing and field experience.

1. All materials shall comply with ASTM E814 or E119 (UL 1429) and shall be manufactured of non-toxic, non-hazardous, asbestos free materials, and unaffected by water or moisture when cured.
  2. Primers: Conform to manufacturer's recommendations for primers required for various substrate and conditions.
  3. Backup materials: Backup materials, supports, and anchoring devices shall be provided as required by UL testing.
- B. Accessories: Provide components for each firestopping system that are needed to install fill materials and to comply with "System Performance Requirements" in Part 1. Use only components specified by the firestopping manufacturer and approved by the qualified testing and inspecting agency for the designated fire resistance rated system. Accessories include but are not limited to the following items:
1. Permanent forming/damming/backing materials must be noncombustible and may include the following:
    - a. Semirefractory fiber (mineral wool) insulation.
    - b. Sealants used in combination with other forming/damming materials to prevent leakage of fill materials in liquid state.
    - c. Joint fillers for joint sealants.
  2. Temporary forming materials.
  3. Substrate primers.
  4. Collars.
  5. Steel sleeves.

#### 2.03 FIRE STOPPING, MATERIALS

- A. Use only firestopping products that have been UL 1479 or ASTM E814 tested for specific fire rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire rating involved for each separate instance.
- B. For penetrations by noncombustible items including steel pipe, copper pipe, rigid steel conduit, and electrical metallic tubing (EMT), the following materials are acceptable:

1. Hilti FAS 601 Elastomeric Firestop Sealant
  2. STI SpecSeal Sealant SSS 100
  3. 3M Fire Barrier CP25
  4. The RectorSeal Corp. Metacaulk 1000, 950, 835, Putty, & Mortar.
  5. Fyre-Sil, Tremco, Inc.
  6. Biofireshield K10 and K2 Mortar, Biostop 500+, Biootherm 100/22200 & Biostop Putty, The RectorSeal Corp.
- C. For penetrations by combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe (closed piping systems) the following materials are acceptable:
1. STI Wrap Strip SSW12
  2. Hilti FS One Intumescent Firestop Sealant
  3. 3M Fire Barrier FS-195 Wrap Strip
  4. Metacaulk Wrap Strip, Firestop Collars, Metacaulk 1000, 950 & 835.
  5. Biostop Wrap Strip, Collar, and Biostop 500+.
- D. For large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways, the following materials are acceptable:
1. STI SpecSeal lightweight mortar SSM22B or putty
  2. Hilti FS635 Trowelable Firestop Compound
  3. 3M Fire Barrier FS-195 Composite Sheet
  4. Biofireshield K-10 & K2 mortar
  5. Metacaulk Firestop Mortar
- E. For fire-rated construction joints and other gaps with movement, the following materials are acceptable:
1. Hilti FS 601 Elastomeric Firestop Sealant
  2. STI Pensil 300
  3. 3M (Dow Corning Fire Stop Sealant 2000)
  4. Fyre-Sil, Tremco, Inc.
  5. Biofireshield, Biostop 700, Biostop 500+
  6. Metacaulk 1000 & 1100
- F. Provide a firestopping system with an "F" rating as determined by UL 1479 or ASTM E814 which is equal to the time rating of construction being penetrated.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of firestopping. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Surface Cleaning: Clean out openings and joints immediately prior to installing firestopping to comply with recommendations of firestopping manufacturer and the following requirements:
  - 1. Remove all foreign materials from surfaces of opening and joint substrates and from penetrating items that could interfere with adhesion of firestopping.
  - 2. Clean opening and joint substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with firestopping. Remove loose particles remaining from cleaning operation.
  - 3. Remove laitance and form release agent from concrete.

3.03 INSTALLING THROUGH-PENETRATION FIRESTOPS

- A. General: Comply with the manufacturer's installation instructions and drawings pertaining to products and applications indicated.
- B. Install forming/damming materials and other accessories of types required to support fill materials during their application and in the position needed to produce the cross sectional shapes and depths required to achieve fire ratings of designate through-penetration firestop systems. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.
- C. Install fill materials for through-penetration firestop systems by proven techniques to produce the following results:

1. Completely fill voids and cavities formed by openings, forming materials, accessories, and penetrating items.
2. Apply materials so they contact and adhere to substrate formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

#### 3.04 INSTALLING FIRE RESISTIVE JOINT SEALANTS

- A. General: Comply with the manufacturer's installation instructions and drawings pertaining to products and application indicated.

#### 3.05 CLEANING

- A. Clean off excess fill materials and sealant adjacent to openings and joints as work progresses by methods and with cleaning materials approved by manufacturers of firestopping products and of products in which opening and joints occur.

END OF SECTION 07840

SECTION 07910 - JOINT FILLERS AND GASKETS

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 joint filler and gasket work is indicated on the drawings and by provisions of this section, and is hereby defined to include required fillers and gaskets not specified in other sections of these specifications.
- B. The required applications of joint fillers and gaskets include, but are not necessarily limited to, the following general types and locations:
  - 1. Joint fillers around penetrations of equipment and services through walls, floors and roofs.

1.03 SUBMITTALS:

- A. Product Data:
  - 1. Submit manufacturer's specifications, installation instructions and recommendations for each type of material required.
- B. Samples:
  - 1. Submit three, 12 inches long samples of each joint filler or gasket.

PART 2 - PRODUCTS

2.01 MATERIALS, GENERAL:

- A. Size and Shape: Provide sizes and shapes of units as shown or, if not shown, as recommended by manufacturer for joint size and condition shown. Where joint movement is a factor in a determination of size, consult with Architect to determine nature and magnitude of anticipated joint movements for the temperature and condition of project at time of installation.

- B. Compressibility: Specified hardness and compressibilities are intended to establish requirements for normal or average conditions of installation and use. Where a range of hardness or compressibility is available for a product, comply with manufacturer's recommendations for specific condition of use.
- C. Color: Provide each concealed material in manufacturer's standard color which has best overall performance characteristics for application shown. Provide exposed materials in black, except where another color is indicated.
- D. Compatibility: Before purchase of each filler or gasket material, confirm that it is compatible with substrate, sealants and other materials in joint system.
- E. Adhesives: Pressure sensitive adhesives, compatible with each material in joint system may be applied (at installer's option) to one face of joint fillers and gaskets to facilitate installation and permanent anchorage. Do not allow adhesives to contaminate sealant bond surface (if any) in joint system.

2.02 CONCRETE CONTROL/EXPANSION JOINT FILLERS:

A. Bituminous and Fiber Joint Filler:

- 1. Provide resilient and non-extruding type premolded bituminous impregnated fiberboard units complying with ASTM D 1751, FS HH-F-341, Type 1 and AASHO M 213.
- 2. Provide one of the following products:
  - a. Flexcell-Knight-Celotex Corporation
  - b. Expansion-Joint Filler; BASF/Sonneborn
  - c. FF-14. Asphalt Fiber-Board; Progress Unlimited
  - d. Fibre Expansion Joint; W.R. Meadows, Inc.
  - e. Conflex Fiber Expansion Control Joint Filler, JD Russell

2.03 CELLULAR/FOAM EXPANSION JOINT FILLERS:

A. Closed-Cell PVC Joint Filler:

- 1. Provide flexible expanded polyvinyl chloride complying with ASTM D 1667. Grade VE 41 BL (3.0 psi compression deflection); except provide higher compression deflection grades as may be necessary to withstand installation forces.

2. Provide one of the following products:

- a. FF2 PVC: Progress Unlimited, Inc.
- b. Vinyl "U" 1000 Series: Williams Products, Inc.

2.04 GASKETS:

A. Molded Neoprene Gasket:

- 1. Provide extruded neoprene or EPDM gaskets complying with ASTM D 2000, Designation 2BC 415 to 3BC 620, black (40 to 60 Shore A durometer hardness); of the profile shown or, if not shown, as required by the joint shape, size and movement characteristics to maintain a watertight and airtight seal.
- 2. Provide products by one of the following manufacturers:
  - a. D.S. Brown Company
  - b. Hohmann & Barnard, Inc.
  - c. Kirkhill Rubber Company
  - d. Progress Unlimited, Inc.
  - e. JD Russell
  - f. Williams Products, Inc.

2.05 MISCELLANEOUS MATERIALS:

A. Oakum Joint Filler:

- 1. Provide untreated hemp or jute fiber rope, free of oil, tar and other compounds which might stain surfaces, contaminate joint walls or not be compatible with sealants.

B. Fire-Resistant Joint Filler:

- 1. Glass fiber or other inorganic non-combustible fiber formed with minimum of binder into resilient joint filler strips or blankets of sizes and shapes indicated, recommended by manufacturer specifically for increasing fire resistance or endurance of joint systems of type indicated, for service temperatures up to 2300 degrees F, 80% (min.) recovery 50% compression.

PART 3 - EXECUTION

3.01 INSPECTION:

- A. Installer must examine joint surfaces of units to receive fillers or gaskets and conditions under which the work is to be performed and notify the General Contractor, in writing, of conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.02 INSTALLATION:

- A. Comply with manufacturer's instructions and recommendations for installation of each type of joint filler or gasket required, unless more stringent requirements are shown or specified.
- B. Set units at proper depth of position in joint to coordinate with other work, including installation of bond breakers, backer rods, and sealants. Do not leave voids or gaps between ends of joint filler units.
- C. Recess exposed edges or faces of gaskets and exposed joint filler slightly behind adjoining surfaces, unless otherwise shown, so that compressed units will not protrude from joints.
- D. Bond ends of gaskets together with adhesive or by means as recommended by manufacturer to ensure continuous watertight and airtight performance. Miter-cut and bond ends at corners except where molded corner units are provided.

END OF SECTION 07910

SECTION 07920 - SEALANTS AND CAULKING

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 at ground mounted signs.
  - 3. Isolation joints, between ground mounted signs and other elements.
  - 4. Paving and sidewalk joints (at new areas or associated with ground mounted signage).
  - 5. Joints at penetrations of walls, decks and floors by piping and other services and equipment.
  - 6. Joints between items of equipment and other construction.
  - 7. 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 the 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 50, 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. Class 50
      2. Dow Corning Dowsil 791; Dow Corning Corp. Class 50
      3. Silpruf; General Electric Class 25 or 50
      4. MasterSeal NP 100, BASF Corp., Building Systems, Inc.
      5. Spectrem 2; Tremco Mfg. Co. Class 50

2. One Component high movement joints (+100/-50):  
Where locations of high movement are indicated.
  - a. Dow Corning Dowsil 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. MasterSeal NP 1; BASF Corp. Building Systems, 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. MasterSeal NP 2; BASF Corp. Building Systems Inc.
      2. Dymeric; Tremco Mfg. Co.
      3. Dynatrol II; Pecora Corp.
      4. Vulkem 922; Mameco
      5. Sikaflex 2cNSEZ; 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. MasterSeal SL 1; BASF Corp. Building Systems Inc.
      2. NR-201 Urexpan; Pecora Corp.
      3. Vulkem 45; Mameco
      4. Sikaflex 1cSL; Sika Corp.

2. Two-component polyurethane self-leveling sealant, complying with ASTM C 920, Type M, Grade P, Class 25.
  - a. Acceptable Standard
    1. MasterSeal SL 2; BASF Corp. Building Systems Inc.
    2. NR-200 Urexpan; Pecora Corp.
    3. Vulkem 245; Mameco
    4. THC900/THC901; Tremco
    5. Sikaflex 2cSL; Sika Corp.

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. MasterSeal, NP 520 BASF Corp. Building Systems, 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, 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 aluminum frames to adjacent dissimilar materials.
  - 3. Joints in concrete site improvements (sidewalks, ramps, etc.) and the joint between the concrete slabs and dissimilar materials.

4. Sealant in pipe sleeves where materials must perforate the floor slab.
  5. 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.
  6. Exterior locations which are noted "caulked" or "sealant" and not specifically listed herein or included in the work of other sections of the Specifications.
  7. 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.

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 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.

3.05 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 they will be without deterioration or damage (other than normal wear and weathering) at time of Owner's acceptance.

END OF SECTION 07920

SECTION 09614 - ADA REPLACEABLE CAST IN PLACE DETECTABLE WARNING SURFACES

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Special Conditions and Division 1 Specifications Section, apply to this Section.

1.02 DESCRIPTION

- A. This Section specifies furnishing and installing Replaceable Cast In Place Detectable/Tactile Warning Surface Tiles where indicated. Note: Provide detectable/tactile warning surface tiles across all new concrete ramp locations whether indicated on drawings or not. Not recommended for asphalt applications.

1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's literature describing products, installation procedures and routine maintenance.
- B. Samples for Verification Purposes: Submit two (2) tile samples minimum 6" x 6" of the kind proposed for use.
- C. Shop Drawings are required for products specified showing fabrication details, composite structural system, tile surface profile, fastener and anchor locations, plans of tile placement including joints, and material to be used as well as outlining installation materials and procedure.
- D. Material Test Reports: Submit complete test reports from qualified accredited independent testing laboratories to qualify that materials proposed for use are in compliance with requirements and meet or exceed the properties indicated on the specifications. All tests shall be conducted on a Replaceable Cast In Place Detectable Tactile Warning Surface Tile system as certified by a qualified independent testing laboratory and be current within a 24 month period.

- E. Maintenance Instructions: Submit copies of manufacturer's specified installation and maintenance practices for each type of Detectable Warning Surface Tile and accessory as required.

1.04 QUALITY ASSURANCE

- A. Provide Replaceable Cast In Place Detectable/Tactile Warning Surface Tiles and accessories as produced by a single manufacturer with a minimum of three (3) years experience in the manufacturing of Cast In Place Detectable/Tactile Warning Surface Tiles.
- B. Installer's Qualifications: Engage an experienced installer certified in writing by Replaceable Cast In Place Detectable/Tactile Warning Surface Tile manufacturer as qualified for installation, who has successfully completed installation similar in material, design, and extent to that indicated for Project.
- C. Americans with Disabilities Act (ADA): Provide Replaceable Cast In Place Detectable/Tactile Warning Surface Tiles which comply with the detectable warnings on walking surfaces section of the Americans with Disabilities Act (Title III Regulations, 28 CFR Part 36 ADA STANDARDS FOR ACCESSIBLE DESIGN, Appendix A Section 4.29.2 DETECTABLE WARNINGS ON WALKING SURFACES).
- D. California Code of Regulations (CCR): Provide only approved DSAAC detectable warning products as provided in the California Code of Regulations (CCR) Title 24, Section 1112A.9 and 1127B.5 for "Curb Ramps" and Section 1133B.8.5 for "Detectable Warnings at Hazardous Vehicular Areas".
- E. Vitrified Polymer Composite (VPC) Replaceable Cast In Place Detectable/Tactile Warning Surface Tiles shall be an epoxy polymer composition with an ultra violet stabilization coating employing aluminum oxide particles in the truncated domes. The tile shall incorporate an in-line pattern of truncated domes measuring nominal 0.2" height, 0.9" base diameter, and 0.45" top diameter, spaced center-to-center 3.4" as measured on a diagonal and 2.35" as measured side by side. For wheelchair safety the field area shall consist of a non-slip

surface with a minimum of 40 - 90° raised points 0.045" high, per square inch; "Armor-Tile" as manufactured by Engineered Plastics Inc., Tel: 800-682-2525, or approved equal.

1. Dimensions: Replaceable Cast In Place Detectable/Tactile Warning Surface Tiles shall be held within the following dimensions and tolerances:  
Length and width: 24" x 48" nominal or as indicated on drawings.  
Depth: .50 (1/2") (+/-) 5% max.  
Face Thickness: 0.1875 (3/16") (+/-) 5% max.  
Warpage of Edge: 0.5% max.  
Fasteners/Anchors: 11 min.
2. Water Absorption of Tile when tested by ASTM D 570-98 not to exceed 0.05%.
3. Slip Resistance of Tile when tested by ASTM C1028-96 the combined Wet and Dry Static Co-Efficient of Friction not to be less than 0.80 on top of domes and field area.
4. Compressive Strength of Tile when tested by ASTM D 695-02a not to be less than 28,000 PSI.
5. Tensile Strength of tile when tested by ASTM D 638-03 not to be less than 19,000 PSI.
6. Flexural Strength of Tile when tested by ASTM D 790-03 not to be less than 25,000 PSI.
7. Chemical Stain Resistance of Tile when tested by ASTM D 543-95 (re approved 2001) to withstand without discoloration or staining - 10% hydrochloric acid, urine, saturated calcium chloride, black stamp pad ink, chewing gum, red aerosol paint, 10% ammonium hydroxide, 1% soap solution, turpentine, Urea 5%, diesel fuel and motor oil.

8. Abrasive Wear of Tile when tested by BYK - Gardner Tester ASTM D 2486-00 with reciprocating linear motion of 37+ cycles per minute over a 10" travel. The abrasive medium, a 40 grit Norton Metallite sand paper, to be fixed and leveled to a holder. The combined mass of the sled, weight and wood block is to be 3.2 lb. Average wear depth shall not exceed 0.060 after 1000 abrasion cycles when measured on the top surface of the dome representing the average of three measurement locations per sample.
9. Resistance to Wear of Unglazed Ceramic Tile by Taber Abrasion per ASTM C501-84 (re approved 2002) shall not be less than 500.
10. Fire Resistance of Tile when tested to ASTM E84-05 flame spread shall be less than 15.
11. Gardner Impact to Geometry "GE" of the standard when tested by ASTM D 5420-04 to have a mean failure energy expressed as a function of specimen thickness of not less than 550 in. lb f/in. A failure is noted when a crack is visible on either surface or when any brittle splitting is observed on the bottom plaque in the specimen.
12. Accelerated Weathering of Tile when tested by ASTM G 155-05a for 3000 hours shall exhibit the following result- $\Delta E < 4.5$ , as well as no deterioration, fading or chalking of surface of tile color No. 33538.
13. Accelerated Aging and Freeze Thaw Test of Tile and Adhesive System when tested to ASTM D 1026 shall show no evidence of cracking, delaminating, warpage, checking, blistering, color change, loosening of tiles or other detrimental defects.
14. Salt and Spray Performance of Tile when tested to ASTM B 117-03 not to show any deterioration or other defects after 200 hours of exposure.

15. AASHTO HB-17 single wheel HS20-44 loading "Standard Specifications for Highways and Bridges". The Replaceable Cast In Place Tile shall be mounted on a concrete platform with 1/32" airspace at the underside of the tile top plate then subjected to the specified maximum load of 10,400 lbs., corresponding to an 8000 lb. individual wheel load and a 30% impact factor. The tile shall exhibit no visible damage at the maximum load of 10,400 lbs.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Replaceable Cast In Place Detectable/Tactile Warning Surface Tiles shall be suitably packaged or crated to prevent damage in shipment or handling. Finished surfaces shall be protected by sturdy plastic wrappings to protect tile from concrete residue during installation and tile type shall be identified by part number.
- B. Replaceable Cast In Place Detectable/Tactile Warning Surface Tiles shall be delivered to location at building site for storage prior to installation.

1.06 SITE CONDITIONS

- A. Environmental Conditions and Protection: Maintain minimum temperature of 40°F in spaces to receive Replaceable Cast In Place Detectable/Tactile Warning Surface Tiles for at least 24 hours prior to installation, during installation, and for not less than (24) hours after installation.
- B. The use of water for work, cleaning or dust control, etc. shall be contained and controlled and shall not be allowed to come into contact with the general public. Provide barricades or screens to protect the general public.

1.07 GUARANTEE

- A. Replaceable Cast In Place Detectable/Tactile Warning Surface Tiles shall be guaranteed in writing for a period of five (5) years from date of final completion.

The guarantee includes defective work, breakage, deformation, fading and loosening of tiles.

## PART 2. PRODUCTS

### 2.01 MANUFACTURERS

- A. The Vitrified Polymer Composite (VPC) Replaceable Cast In Place Detectable/Tactile Warning Surface Tiles specified is based on Armor-Tile manufactured by Engineered Plastics Inc. (800-682-2525) existing engineered and field tested products, which have been in successful service for a period of three (3) years are subject to compliance with requirements, may be incorporated in the work and shall meet or exceed the specified test criteria and characteristics.
- B. Color: Color shall be homogeneous throughout the tile. Tiles are available in Yellow conforming to Federal Color No. 33538, Light Grey (Federal Color No. 26280), Dark Grey (Federal Color No. 36118), Onyx Black (Federal Color No. 17038), Pearly White (Federal Color No. 37875), Brick Red (Federal Color No. 22144), Ocean Blue (Federal Color No. 15187), Ochre Yellow (Federal Color No. 23594), and Colonial Red (Federal Color No. 20109). Color to be selected by Architect.

## PART 3. EXECUTION

### 3.01 INSTALLATION

- A. During Replaceable Cast In Place Detectable/Tactile Warning Surface Tile installation procedures, ensure adequate safety guidelines are in place and that they are in accordance with the applicable industry and government standards.
- B. Prior to placement of the Replaceable Cast In Place Detectable/Tactile Warning Surface Tile system, review manufacturer's instructions and contract drawings with the Contractor prior to the construction and refer any and all discrepancies to the Project Architect/Engineer.

- C. The specifications and related materials shall be in strict accordance with the contract documents and the guidelines set by their respective manufacturers. Not recommended for asphalt applications.
- D. The physical characteristics of the concrete shall be consistent with the contract specifications while maintaining a slump range of 4 - 7 to permit solid placement of the Replaceable Cast In Place Detectable/Tactile Warning Surface Tile system. An overly wet mix will cause the tile to float. Under these conditions, suitable weights such as sandbags shall be placed on tile.
- E. The concrete pouring and finishing operations require typical mason's tools, however, a 4' long level with electronic slope readout, and 10lb. sandbags are specific to the installation of the Replaceable Cast In Place Detectable/Tactile Warning Surface Tile system.
- F. The factory-installed plastic sheeting must remain in place during the entire installation process to prevent the splashing of concrete onto the finished surface of the tile.
- G. When preparing to set the tile, it is important that no concrete be removed in the area to accept the tile. It is imperative that that installation technique eliminates any air voids under the tile. Gaps in the tile perimeter allow air to escape during the installation process.
- H. The concrete shall be poured and finished true and smooth to the required dimensions and slope prior to the tile placement. Immediately after finishing concrete, the electronic level should be used to check that the required slope is achieved. The tile shall be placed true and square to the curb edge in accordance with the contract drawings. The Replaceable Cast In Place Detectable/Tactile Warning Surface Tiles shall be tamped (or vibrated) into the fresh concrete to ensure that the field level of the tile is flush to the adjacent concrete surface. The embedment process should not be accomplished by stepping on the tile as this may cause uneven setting which can result in air voids under the

tile surface. The contract drawings indicate that the tile field level (base of truncated dome) is flush to adjacent surfaces to permit proper water drainage and eliminate tripping hazards between adjacent finishes.

- I. In cold weather climates it is recommended that the Replaceable Cast In Place Detectable/Tactile Warning Surface Tiles be set deeper such that the top of domes are level to the adjacent concrete on the top and sides of ramp. This installation will reduce the possibility of damage due to snow clearing operations. Care should be taken to finish the concrete on the side of the tile with the lower elevation, adding channels to allow water to drain from the field surface of the tile.
- J. Immediately after placement, the tile elevation is to be checked to adjacent concrete. The elevation and slope should be set consistent with contract drawings to permit water drainage to curb as the design dictates. Ensure that the field surface of the tile is flush with the surrounding concrete and back of curb so that no ponding is possible on the tile at the back side of curb.
- K. While concrete is workable, a 1/8" radius edging tool shall be used to create a finished edge of concrete, then a steel trowel shall be used to finish the concrete around the tile's perimeter, flush to the field level of the tile.
- L. During and after the tile installation and the concrete curing stage, it is imperative that there is no walking, leaning or external force placed on the tile that may rock the tile causing a void between the underside of tile and concrete.
- M. Following tile placement, review installation tolerances to contract drawings and adjust tile before the concrete sets. Suitable weights of 10 to 25 lb. each may be required to be placed on each tile as necessary to ensure solid contact of the underside of tile to concrete.

- N. Following the concrete curing stage, protective plastic wrap is to be removed from the tile surface by cutting the plastic with a sharp knife, tight to the concrete/tile interface. If concrete bled under the plastic, a soft brass wire brush will clean the residue without damage to the tile surface.
- O. Tiles can be cut to custom sizes, or to make a radius, using a continuous rim diamond blade in a circular saw or mini-grinder. Use of a straightedge to guide the cut is advisable where appropriate.

3.02 REPLACING TILES, PROTECTING AND MAINTENANCE

- A. Protect tiles against damage during construction period to comply with Tactile Tile manufacturer's specification.
- B. Protect tiles against damage from rolling loads following installation by covering with plywood or hardwood.
- C. Replace tiles by method specified by Tactile Tile manufacturer.
- D. Comply with manufacturer's maintenance manual for cleaning and maintaining tile surface. It is recommended to perform annual inspections for safety and tile integrity.

END OF SECTION 09614

SECTION 10430 - EXTERIOR GROUND MOUNTED SIGN

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections apply to this Section.

1.2 SUMMARY

- A. This section includes the following:

- 1. Exterior Ground Mounted Signage

- B. Related Sections: The following sections contain requirements that relate to this section.

- 1. 03001 - Concrete Work
  - 2. 04720 - Cast Stone
  - 3. 05500 - Metal Fabrications

1.3 SYSTEM PERFORMANCE REQUIREMENTS

- A. Design Criteria: Design, fabricate and install exterior post and panel-type signs to withstand a wind pressure of 100 mph on the total sign area in all directions.

1.4 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data: Include manufacturer's construction details relative to materials, dimensions of individual components, profiles and finishes for each type of sign required. Provide manufacturer's recommendations for maintenance and cleaning requirements for exterior sign surfaces.

- C. Shop Drawings: Include plans, elevations and not less than 3/4-inch scale sections of typical members and other components. Show anchors, reinforcement, accessories, layout and installation details.
1. Indicate required location of connections to electrical service provided as a unit of work under other sections.
  2. Provide message list, including not less than half-size details of wording and lettering layout. Include full-size details of special graphics.
    - a. Furnish full-size templates for cutout letters, numbers and other graphic symbols.
    - b. Provide setting drawings, templates and directions for installation of anchor bolts and other anchors to be installed as a unit of Work in other sections.
- D. Wiring diagrams from the manufacturer for internally illuminated signs.
- E. Samples: For each sign component provide the following samples showing finishes, colors and surface textures.
1. For verification of color, pattern and texture selected and compliance with requirements indicated.
  2. Aluminum: Samples of each finish type and color on 6-inch long sections of extrusions and not less than 4-inch squares of sheet or plate. Where finishes involve normal color and texture variations, include sample sets showing the full range of variations expected.
  3. Acrylic, Polycarbonate: Provide a sample panel not less than 8-1/2 inches by 11 inches. Include a panel for each color required.
    - a. In each panel include a representative sample of the graphic image process required showing graphic style and colors and finishes of letters, numbers and other graphic devices.

4. Sign Cabinet and Housing: Samples of each finish type and color, on 6-inch long sections of extrusions and not less than 4-inch squares of sheet or plate. Where finishes involve normal color and texture variations, include sample sets showing the full range of variations expected.
5. Provide a sample panel not less than 8-1/2 inches by 11 inches. Include a panel for each color required.
  - a. In each panel include a representative sample of the graphic image process required showing graphic style and colors and finishes of letters, numbers and other graphic devices.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer who is an authorized representative of the sign manufacturer and has completed installation of exterior post and panel signs similar in material, design and extent to those indicated for the project and that has resulted in construction with a record of success in service performance.
- B. UL and NEMA Compliance: Provide internal LED light fixtures and electrical components required as part of illuminated post and panel signs that are listed and labeled by UL and comply with applicable NEMA standards.
- C. Single-Source Responsibility: Obtain each sign and related equipment through single source from a single manufacturer.

#### 1.6 DELIVERY AND HANDLING

- A. Delivery: Provide protective covering or crating as recommended by the manufacturer to protect sign components and surfaces against damage during transportation and delivery.

1. Coordinate time of delivery so that pylon signs can be installed within 24 hours of receipt at the project site.
- B. Handle signs carefully to prevent breakage, surface abrasion, denting, soiling and other defects. Comply with the manufacturer's handling instructions for unloading components subject to damage.
  1. Inspect sign components for damage upon delivery. Do not install damaged sign components. Repair minor damage to signs provided the finished repair is equal in all respects to the original work and is acceptable to the Architect; otherwise remove and replace damaged sign components.

#### 1.7 WARRANTY

- A. Signs Panel Warranty: Submit a written warranty signed by the manufacturer agreeing to repair signs due to coating or construction degradation.
  1. Warranty Period: Five (5) years.

#### PART 2 - PRODUCTS

##### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements.

##### 2.2 MATERIALS

- A. Aluminum Sheet or Plate: Provide alloy and temper recommended by the aluminum producer or finisher for the type of use and finish indicated and with not less than the strength and durability properties in ASTM B 209 for 5005-H15.

- B. Aluminum Extrusions: Provide alloy and temper recommended by the aluminum producer or finisher for the type of use and finish indicated and with not less than the strength and durability properties specified in ASTM B 221 for 6063-T5.
- C. Cast Acrylic Sheet: Provide cast (not extruded or continuous cast) methyl methacrylate monomer plastic sheet in sizes and thickness indicated with a minimum flexural strength of 16,000 psi when tested in accordance with ASTM D 790, a minimum allowable continuous service temperature of 176 degrees F (80 degrees C) and of the following general types:
  - 1. Translucent Sheet: Provide white translucent acrylic sheet of density required to produce uniform brightness and minimum halation effects where acrylic is indicated as "white."
- D. Fasteners: Unless otherwise indicated, use concealed fasteners fabricated from metals that are non-corrosive to either the sign material or the mounting surface.
- E. Anchors and Inserts: Use nonferrous metal or hot-dipped galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion bolt devices for drilled-in-place anchors. Furnish inserts as required to be set into concrete.

### 2.3 COMPONENTS

- A. Panels: Provide smooth, even, level sign panel surfaces constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch measured diagonally from corner to corner.
  - 1. Framed Hollow Box-Type Panels: Provide framed hollow box sign message panels finished to comply with the following requirements:
  - 2. Finish: Manufacturer's standard semi-gloss finish with ultraviolet inhibitors.

3. Provide clips welded to the back of panels for installation without visible fasteners.
- B. Frames: Fabricate frames to profile indicated; comply with the following requirements:
1. Frame Material: SignComp Commercial extruded aluminum.
  2. Frame Finish: Match finish of the panel.
  3. Corner Condition: Square corners unless noted otherwise.
- C. Illuminated Units: Provide internal illumination as indicated using standard lighting components. Provide an accessible concealed internally wired LED fixture system to illuminate message panels uniformly with minimum halation and without light leaks. Make provisions for servicing and concealed connection to electric service. Coordinate electrical characteristics with those of the power supply provided.
1. LED Lighting: Provide the number of LED fixtures indicated or required by the sign panel size.
  2. Drivers: Provide low energy, exterior type LED driver that is U.L. listed.
  3. Provide transformers, insulators and other components necessary for operation.
- D. Graphic Content and Style: Provide sign copy to comply with the requirements indicated for sizes, styles, spacing, content, positions, materials, finishes and colors of letters, numbers, symbols and other graphic devices.
1. Cutout Copy: Machine-cut letters, numbers, symbols and other graphic devices through the sign panel to produce precisely formed copy. Use high-speed cutters mechanically linked to master templates in a pantographic system or equivalent process capable of producing characters of the style indicated with sharply formed edges.

2. Backup: Provide 0.125-inch thick translucent acrylic sheet back-up attached to back side of the panel.
3. Backup: Provide 0.125-inch thick acrylic sheet back-up with precise-fitting copy cut from 0.250-inch thick transparent acrylic sheet projecting through engraved copy chemically welded to acrylic back-up.

#### 2.4 FABRICATION

A. General: Provide the manufacturer's standard double post, and/or single-panel-type post and panel signs. The completed sign assembly shall consist of a message panel supported between two posts. Comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes and details of construction.

1. Allow for thermal movement resulting from a maximum ambient temperature change (range) of 100 degrees F (55.5 degrees C). Design, fabricate and install post and panel sign assemblies to prevent buckling, opening up of joints and over-stressing welds and fasteners.
2. Base design on actual surface temperatures of metals due to both solar heat gain and nighttime sky heat loss.

B. Welded Connections: Comply with AWS for recommended practices in shop welding. Provide welds behind finished surfaces without distortion or discoloration of the exposed side. Clean exposed welded surfaces of welding flux and dress on all exposed and contact surfaces.

1. Mill joints to a tight, hairline fit. Form joints exposed to the weather to exclude water penetrations.

2. Conceal fasteners where possible; otherwise locate fasteners where they will be inconspicuous.
- C. Posts: Fabricate posts to lengths required for mounting method indicated.
1. Provide posts to support sign as indicated.
  2. Base Plate: Provide posts with base plates, flanges or other fittings of sizes recommended by the manufacturer, welded to bottom of posts. Pre-drill slotted holes in base plate for anchor bolt connection.
    - a. Furnish templates as necessary for accurate setting of anchor bolts in concrete foundations.
    - b. Provide anchor bolts of size required for connection of posts to concrete foundations.
- D. Panels: Form panels to required size and shape. Comply with requirements indicated for design, dimensions, finish, color and details of construction.
1. Coordinate dimensions and attachment methods to produce message panels with closely fitting joints. Align edges and surfaces with one another in the relationship indicated.
  2. Increase metal thickness or reinforce with concealed stiffeners or backing materials as required to produce surfaces without distortion, buckles, warp or other surface deformations.
  3. Continuously weld joints and seams except where other methods are indicated; grind, fill and dress welds to produce smooth flush exposed surfaces with welds visible after final finishing.

## 2.5 ELECTRICAL

- A. LED lighting shall operate from the following power source:
  - 1. 120 VAC, 60 Hz single-phase, including neutral and earth ground.
- B. Earth Grounding: The sign manufacturer shall provide an earth ground lug in the sign. The installation contractor shall provide the balance of materials and services needed to properly earth ground the sign.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrate, areas and conditions with installer present for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Verify that items, including anchor inserts and electrical power are sized and located to accommodate signs.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Furnish templates, anchor bolts, internal reinforcing and other items required to be set in concrete post foundations at proper time for setting.

### 3.3 INSTALLATION

- A. General: Locate sign units and accessories where indicated, using mounting methods of the type described and in compliance with the manufacturer's instructions.

- B. Excavation: Excavate for sign foundation to elevations and dimensions indicated. Reconstruct subgrade that is not firm, undisturbed or compacted soil or that is damaged by freezing temperatures, frost, rain, accumulated water or construction activities by excavating a further 12 inches (300 mm), back-filling with satisfactory soil and compacting to original subgrade elevation.
- C. Set anchor bolts and other embedded items required for installation of signs. Use templates furnished by suppliers of items to be attached.
  - 1. Protect portion of pylons above ground from concrete splatter.
- D. Mechanical Fasteners: Attach signs with fasteners and anchors suitable for secure attachment to substrate as recommended in writing by sign manufacturer.
- E. Install signs level, plumb and at the height indicated with sign surfaces free from distortion or other defects in appearance.

#### 3.4 CLEANING

- A. At completion of the installation, clean soiled surfaces of sign units in accordance with the manufacturer's instructions.

#### 3.5 PROTECTION

- A. Protect installed sign units from damage until acceptance by the Owner

END OF SECTION 10430