PROJECT MANUAL
FOR
SMOUSE OPPORTUNITY SCHOOL EXTERIOR IMPROVEMENTS

Bid No: B8717

2820 Center Street
Des Moines, Iowa 50312

Owner
Des Moines Independent Community School District
2100 Fleur Drive
Des Moines, Iowa 50321

Architect
STUDIO MELEE
1312 LOCUST STREET, SUITE 100Z
Des Moines, Iowa 50309
ARCHITECT’S CERTIFICATION:
I hereby certify that the Specifications contained herein were prepared by me or under my direct supervision and responsible charge. I am a duly licensed Architect under the laws of the State of Iowa.

David Abler, AIA  Reg. No. 05425  Date 9/8/2021

License Expires: June 30th, 2022
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NOTICE IS HEREBY GIVEN: Sealed proposals will be received by the Construction Supply Chain Analyst of the Des Moines Independent Community School District at their office, Des Moines Independent Community School District, Operations Center, 1917 Dean Avenue, Des Moines, Iowa 50316 until three o’clock p.m. on the 7th Day of October 2021, for the construction/repair and/or installation of the following improvement(s):

Bid No. B8717 Smouse Exterior Restoration

Commencing September 8, 2021 copies of the plans and specifications for the Project are on file with and available from Beeline and Blue 2507 Ingersoll Avenue, Des Moines, Iowa 50312. Plans may also be inspected at the following locations: Construction Update Internet plan room; F. W. Dodge Corporation scan services; or at the school district’s Operations Center 1917 Dean Avenue, Des Moines, Iowa 50316. Bids must be submitted on the approved bid form available in the plans and specifications. No oral, facsimile, telephonic or telephonic bids or modifications will be considered.

Bidders will be required to provide a security deposit, in the form of an approved Bid Bond, cashier’s or certified check, or certified share draft in the amount of five percent (5%) of the amount of each bid, in a separate attached envelope.

A Mandatory Pre-Bid Conference will be held at 3:00 p.m., Wednesday September 22, 2021 at Smouse Opportunity School, 2820 Center St, Des Moines, Iowa 50312. Meet at the main office entrance. Note: Mandatory Pre-Bid attendance is required by the Owner for all Contractors desiring to submit a bid for this project, by having a company representative attend this Pre-Bid Meeting. If any Contractor desiring to submit a bid and cannot attend the scheduled Pre-Bid meeting, they may call the Owner at 515-943-6019 and speak with Dave Berger about scheduling another time prior to the September 22, 2021 Pre-Bid meeting. No additional Pre-bid meetings will be scheduled after September 22, 2021.

Lump-sum bids will be received under one contract as described in the specifications. Bids will be opened and read aloud immediately after specified closing time for receiving bids. All interested parties are invited to attend.

Consideration of the bids received, and the award of contract or other action may be made by the Board of Directors of the Des Moines Independent Community School District upon the proposals received in accordance with the law and the plans and specifications at its meeting to be held at 6:00 p.m. on October 19, 2021 in the District Board Room at 1800 Grand Avenue Des Moines Iowa or at any other published and/or posted location of the Board meeting.

The Board of Directors may make the award to the lowest responsive, responsible bidder meeting specifications. The right is reserved to reject any or all bids, or any part thereof, and to waive informalities, and to enter into such contract or contracts as shall be deemed in the best interests of the Des Moines Independent Community School District.

By virtue of statutory authority, a preference will be given to products and provisions grown and coal produced within the State of Iowa, and to Iowa domestic labor.

All bids will be governed by applicable provisions in the Iowa Code and Board Policies.

Shashank Aurora
Secretary of the Board
Des Moines Independent Community School District
PART 1 - GENERAL

Des Moines Independent Community School District, State of Iowa, hereinafter called the “Owner,” has advertised for bids to be submitted for the construction work specified in the advertisement. Proposals to be entitled to consideration shall be in accordance with the following:

1.1 DEFINITIONS

A. Bids are sums stipulated in Proposals for which Bidders propose to perform the Work.

B. Unit Prices are sums included in Proposals as Bids per unit measure of materials and/or services, as required in the Bidding Documents.

C. Proposals are complete, properly executed forms including all information requested by the Owner.

D. Bidders are qualified contractors who submit Proposals to the Owner for Work as Prime Contractors on the Project.

E. Alternate Prices are lump sum prices included in the Proposals for labor, materials and/or services that are not included in the base bid.

1.2 EXAMINATION OF SITE and DOCUMENTS

Each Bidder shall visit the site of the proposed work and shall completely inform himself relative to construction hazards, procedure, labor, and all other conditions and factors, local and otherwise, which would affect prosecution and completion of the work and its cost. All visits to the site shall be coordinated through the Owner’s Representative. Such considerations shall include, without limitations, the arrangement and condition of existing structures and facilities; the procedure necessary for maintenance of uninterrupted, safe operation, use and occupancy of existing facilities; the availability and cost of labor; and facilities for transportation, handling and storage of materials and equipment. All such factors shall be properly investigated and considered in the preparation of the bid. Each bidder shall so fully examine the plans and specifications and acquaint himself with their requirements and with the conditions surrounding the construction on the site that he shall be fully familiar with and informed of all facilities, difficulties, and problems associated with or which might be incurred in the prosecution of the work. In case of disagreement between drawings and specifications or within either document itself, the better quality or greater quantity of work shall be figured in the bid (see GC. 6.04). It shall be the responsibility of the Bidder to direct the attention of the Architect and Owner in writing and at least seventy-two (72) hours prior to the time set for the opening for the opening of the bids, any seeming inconsistencies, ambiguous requirements, omissions, or any other matter which seems to require explanation, and to request clarification. The submission of a bid shall be taken as prima facie evidence of compliance with this requirement and as an acknowledgment that the Bidder has received all the required documents and has visited the site. There will be no subsequent financial adjustment for lack of such prior information.

1.3. INTERPRETATION

No oral interpretations will be made by anyone to any Bidder as to the true meaning or requirements of any part of the drawings, specifications or other proposed Contract Documents. Every request for an interpretation shall be made in writing and addressed and forwarded to the Owner’s Representative not later than seven (7) calendar days before the date fixed for opening of bids. The person submitting the request shall be responsible for its prompt delivery. Every interpretation made to a Bidder will be in the form of an addendum to the Contract Documents, which, if issued, will be sent as promptly as is practicable to all persons to whom the drawings, specifications, and other proposed Contract Documents
have been issued. All such addenda shall become part of the Contract Documents and their receipt shall be acknowledged in the Bid Proposal. The Owner will not be responsible for any other explanations or interpretations of the proposed Contract Documents.

1.4 PROPOSAL FORMS

Proposal forms included in the specification may be copied and used for submitting proposals. Proposals shall be made upon the forms provided therefore. Refer to Document 00311 Proposal Form Instructions, and Document 00311 Proposal Form. Any Proposal NOT submitted on required forms may be rejected.

Attention is directed to the fact that the Contract Documents contain one complete set of bidding and contract forms; these are sample forms included for the information of Bidders. They are not to be detached from the Contract Documents, filled out or executed.

Special attention is directed to the Form of Bid Bond (Document 00410) included in the bidding documents. Additional copies of this form may be secured from the Owner’s Representative, but the use of this particular form is not mandatory. Any similar standard form of a recognized responsible surety which contains the same stipulations and guarantees, the same execution of the contract and indemnification of the Owner in case of default, will be acceptable.

1.5 PREPARATION OF PROPOSAL FORMS

All proposal forms must be prepared in single copy and in conformity with and be based upon and submitted subject to all requirements of the Contract Documents. They must be fully completed with all blanks appropriately filled in. Each bid shall be legibly written or printed in ink on the separate form provided. No alterations in bids, or in the printed forms therefore, by erasures, interpolations, or otherwise will be acceptable unless each such alteration is signed or initialed by the Bidder; if initialed, the Owner may require the Bidder to identify any alteration so initialed. No alteration in any bid, or in the form on which it is submitted, shall be made after the bid has been submitted.

It will be the Bidder’s responsibility to secure any and all addenda from the Architect. The Bidder will be required to acknowledge receipt of all addenda. Owner reserves the right to reject any bid which is received which has not been based upon all addenda issued by the Architect.

No Bidder may submit more than one bid. Multiple bids under different names will not be accepted from one firm or association.

The Bidder is required to bid on all alternates and complete all blanks on the bid form. If alternates are called for on a type or method of construction as to which the Bidder does not desire to bid, the Bidder shall insert the words “NO BID.” In case the Bidder desires to bid on an alternate, it shall set forth in the space provided therefore, the amount to be added or deducted from the base bid or in the event that the Bidder does not desire to make a change from the base bid, it shall so indicate by using the words “NO CHANGE.” In the selection of alternates, the Owner reserves the right to select or reject any or all alternates in the proposal if, in the judgment of the Board of Directors, or its designees, the best interest of the School District will be so served.

1.6 BID PERFORMANCE GUARANTIES

Bid security (single copy) in the form of a certified or cashier’s check, certified share draft, money or surety bond in the amount of at least five (5%) percent of the bid price, payable without condition or qualification to Des Moines Independent Community School District, shall accompany each bid in the OUTER envelope, as evidence of good faith and as a guarantee that if awarded the contract, the Bidder
will execute the Contract and give bond as required. The Bidder assumes all responsibility for furnishing acceptable bid security.

Bid security in the form of a bond (see Document 00410) will be accepted only if from a regularly established firm licensed to write such surety in the State of Iowa.

The bid security of each unsuccessful Bidder will be returned when the Construction Agreement is fully executed. The bid security will be voided but retained by the Owner, if, after the Notice of Contract Award, the Bidder shall enter into a Contract and file a satisfactory performance bond, labor and material payment bond, and certificates of required insurance, all within ten (10) calendar days after the date such notice is given by the Owner. The bid security of the second and third lowest responsible Bidders may be retained for not to exceed forty-five (45) days after opening, pending the execution of the Construction Agreement and submission of bond by the successful Bidder.

This bid security may be retained by the Owner as liquidated damages, if the bid is accepted and a contract thereon is awarded but the successful Bidder fails to enter into a contract in the form prescribed with legally responsible sureties, within ten (10) calendar days after date of Notice of Contract Award is given by the Owner.

The Owner shall require the Bidder to whom a Contract is awarded to furnish to the Owner both Performance and Labor and Material Payment bonds in the amount of one hundred (100%) percent of the Contract price, covering the faithful performance of the Contract and the payment of all obligations arising thereunder, and the Bidder will further provide warranties as required by the specifications or General Conditions.

The bonds shall be executed on the forms included with the Contract Documents (forms shall not be removed from the Contract Documents; Bidders may use copies of the bond forms included in the specifications). Accompanying each bond form shall be a “Power of Attorney” authorizing the attorney in fact to bind the surety company and certified to include the date of the bond.

**1.7 LIST OF SUBCONTRACTORS AND SUPPLIERS OF LABOR AND MATERIAL**

The lowest bidder for each contract shall, within twenty-four (24) hours following the bid opening, provide the Owner with the **signed** List of Subcontractors and Suppliers of Labor and Material on the form provided in Section 00100 Instructions to Bidders. Subcontractor is any entity performing 1-1/2% or more of the contract value. The List shall detail the quotations used in the preparation of the bid and whose services are proposed to be used in construction of the project. The List must be complete showing all sections in the Construction Documents. Failure to submit the List may preclude the bid from further consideration by the Owner. The Owner reserves the right to either disclose or not disclose the List of the successful Bidder.

Each Bidder shall identify and fully disclose on the List all those subcontractors and suppliers proposed for the work with which the Bidder is connected either directly or indirectly as part owner, participant in profits and losses or in any other manner financially or economically.

**1.8 BACKGROUND INFORMATION**

The lowest bidder for each contract shall, within twenty-four (24) hours following the bid opening, provide the Owner with the Background Information included in **Section 00100 Instructions to Bidders**. The Contractor must complete and fully disclose all information requested in the Background Information. Failure to submit the Background Information may preclude the bid from further consideration by the Owner.
The Owner may make such investigations as deemed necessary to determine the ability and qualification of the Bidder. Bidders shall submit within twenty-four (24) hours, if requested by the Owner, such evidence of the Bidder's competency and practical knowledge to do the particular work covered by his proposal and of the Bidder's financial responsibility, resources, experience, organization and equipment to complete the proposed work. Failure to comply with this requirement may result in the rejection of consideration of such bid.

In determining the Bidder’s qualifications, the following factors, among others, will be considered: work previously completed by the Bidder; the qualifications of the proposed subcontractors for their work; Bidder references; and whether the Bidder (a) maintains a permanent place of business; (b) has adequate plant and equipment to do the work properly and expeditiously; (c) has the financial resources to meet all obligations incident to the work; (d) has appropriate technical experience; and (e) has adequate, competent, experienced staff and supervisors who will be committed to the work until completion.

Each Bidder may be required to show that he has handled former work and that no just claims have been prosecuted or are pending against such work. No bid will be accepted from a Bidder who is engaged on any work which would impair his ability to perform or finance this work or other work in progress.

The Owner reserves the right to reject any bid if the Owner determines, in its sole and absolute discretion, that the Bidder is not properly qualified to carry out the obligations of the Contract and/or to complete the work contemplated by the contract. Conditional bids will not be accepted.

1.9 PERMITS AND FEES

The School District shall secure and pay for the general building permit. Trade contractors will be responsible to obtain and pay for their specialty permits. The Owner is exempt from paying certain fees and it will be the contractor’s responsibility to acquaint himself with the laws and regulations governing said fees. Attention is directed to the requirements of the General Conditions regarding obtaining permits. The contractor shall obtain and pay for all fees associated with work in the Department of Transportation right of way.

1.10 TAXES

Sales and use taxes shall be excluded from the bid for all items incorporated into the final project. The Owner will provide sales tax exemption certificates as appropriate. See section 00700 General Conditions paragraph 12.04 for additional requirements.

1.11 SIGNATURE OF BIDDERS

Each Bidder shall sign and notarize the bid form, on the last page of the form and the bid bond. If the Bidder is an individual, the Bidder must sign in individual capacity. Bids by partnerships shall be signed with the partnership name followed by the signature and designation of one of the partners or other authorized representative. Bids by corporations shall be signed with the name of the corporation followed by the signature and designation of the president or other person authorized to bind the corporation and attested to by the secretary with corporate seal (if available). Bids by joint ventures shall be signed by each participant in the joint venture or by an authorized agent of each participant. The names of all persons signing should also be typed or printed below the signature. A bid by a person who affixes to his signature the word “president,” “secretary,” “agent,” or other designation without disclosing his principal may be held to be the bid of the individual signing. When requested by the Owner, evidence of the authority of the person signing shall be furnished.
1.12 SUBMISSION OF BIDS

Bid Documents shall be enclosed in two envelopes (OUTER and INNER), each of which shall be sealed and clearly labeled “BID DOCUMENTS” and identified with the description of the work to which the proposal applies; the name of the project; the name and address of the Bidder; and the time of opening bids; all in prominent lettering so as to guard against opening prior to the stipulated time. The INNER envelope shall include the form of proposal (Document 00311) and Shall be marked “BID ENCLOSED”. The “OUTER envelope” shall include the Bid Bond (Document 00410), along with the INNER envelope. If the OUTER envelope does NOT include the required document, the INNER “BID ENCLOSED” envelope will NOT be opened. No responsibility shall attach to any employee of the Owner for the premature opening of any bid not prominently identified. The Bidder shall be responsible for placing his firm name and the name and number, if applicable, of the project and the time of the bidding on the outside of such bid envelope.

The Bid Documents shall be submitted at the time and location as noted in the Invitation to Bid. Bids received after the specified time of closing will be returned unopened.

1.13 WITHDRAWAL OF BIDS

Any Bidder may withdraw his bid if written request for withdrawal signed in the same manner and by the same person who signed the Bid Form is received by the individual of the School District requesting the bids prior to the time established for the opening of the bids.

No Bidder may withdraw his bid for forty-five (45) days after the scheduled time set for the opening thereof, or before award of the Contract, unless said award is delayed for a period exceeding forty-five (45) calendar days.

1.14 MODIFICATIONS

No oral, telephonic, or telegraphic modifications will be considered.

1.15 ACCEPTANCE OF BIDS

The Owner reserves the right to accept the bid which in its judgment is the most responsive responsible and best bid or to reject any and all bids and alternatives and to waive or disregard irregularities or informalities in any bid as it may deem to be in the best interest of the School District. The Board of Directors or its designees may consider as irregular any bid on which there is an alteration of, or departure from, the bid form. All proposals received after the specified time of closing shall be returned unopened.

Final determination of compliance with specifications will rest with the Owner.

1.16 APPLICABLE LAWS AND REGULATIONS

Each Bidder shall familiarize himself with all state and local laws, codes, ordinances, and regulations which might in any manner affect the work to be done; the materials to be supplied; the taxes, permits and fees to be paid; or the labor to be employed in and about the work. Any claim of misunderstanding or ignorance on the part of any successful Bidder will not in any way excuse such Bidder from the necessity of full compliance with every such law, code, ordinance, or regulation. All state laws, codes and regulations and local ordinances, which are applicable, shall be complied with including but not limited to those specified in these documents.
1.17 **INSURANCE**
Throughout the life of the contract, the Contractor will be required to carry the types and amounts of insurance named in the General Conditions.

1.18 **CONTRACTOR’S LICENSE**
Any successful Bidder may be required by the Owner to obtain the necessary and applicable Contractor’s License from all appropriate governmental authorities and if required, shall not allow any subcontractor to commence work on his subcontract until all similar provisions required of the subcontractor have been obtained and approved.

1.19 **POST-BID INTERVIEWS**
Bidders in contention for contract awards may be asked to attend Post-Bid Interviews, submit Post-Bid Submittals in rough draft for review. (See Document 00500.)
BACKGROUND INFORMATION

All questions must be answered, and the data given must be clear and comprehensive. If necessary, questions may be answered on separate attached sheets. The bidder may submit any additional information.

1. When Organized

2. If Corporation, Where Incorporated

3. How many years have you been engaged in the contracting business under your present firm or trade name? _________

4. List all of the surety/bonding companies you have utilized in the last five (5) years ______

5. Have you ever been declared in default under a performance bond in the last five (5) years? ________ If so, describe the circumstances and which surety/bonding company was involved. Include the name and contact person of the owner(s). ______

6. Have you ever been previously found to be a non-responsive or non-responsible bidder under Iowa Code Chapter 26, Iowa Code Section 73A or other applicable law or governing authority? __ ______ If yes, please describe the circumstances ______

7. List all the projects over one million dollars ($1,000,000) you are currently under contract for, including the contract value, the scheduled completion date, contact person and phone number. Also list any experience in school construction similar to this project of any value.

8. Are you currently being investigated for or previously been found to have violated in the last five years any of the following state or federal laws: Iowa Minimum Wage Act, Iowa Non-English Speaking Employees Act, Iowa Child Labor Act, Iowa Labor Commissioner’s Right to Inspect Premises, Iowa Compensation Insurance Act, Employment Security Act, Iowa Competition Act, Iowa Income, Corporate and Sales Tax Code, a ‘willful’ violation of the Iowa or Federal Occupational Safety and Health Act, Iowa Employee Registration Requirements, Iowa Hazardous Chemical Risks Act, Iowa Wage Payment Collection Act, Federal Income and Corporate Tax Code, The National Labor Relations Act, The Drug-Free Workplace Act, The Employee Retirement Insurance Security Act, The Fair Labor Standards Act) Yes ____________ No ____________ If yes, please explain: ________________
9. Do you currently have any legal action pending which could impact your ability to perform this Project? ________________ If yes, please explain: ________________

10. Acknowledge that experience working on historical structures is required and that the contractor may be asked to provide documented evidence of providing similar services in the restoration of historical structures, including summaries of the scopes of work for each project, value, and contact information for the owner/client. ________________

No actions will be made on the basis of answers to the above questions without an inquiry and an opportunity to be heard regarding the circumstances of the matters reported.

The undersigned hereby authorizes and requests any person, firm or corporation to furnish any credit history and financial condition or other information required by the District in verification of the recitals comprising this statement of Background Information. The undersigned further authorizes the District to conduct any and all necessary investigations of the undersigned’s federal and state Occupational Safety and Health Act (OSHA) Compliance, including access to State and Federal records.

I hereby certify that the above information is true and correct to the best of my knowledge and that the District may rely on the information provided.

THIS STATEMENT MUST BE NOTARIZED.

NAME OF CONTRACTOR: ____________________________

BY: ____________________________________________
    Signature                Title
    ____________________________

    Type/Print Name                Date
    ____________________________

STATE OF IOWA, _________________ COUNTY, ss:
Subscribed and sworn to before me by the said ____________________________ on this ___ day of ____
______________________, 20__.

____________________________________
Notary Public in and for the State of Iowa
LIST OF SUBCONTRACTORS AND SUPPLIERS OF LABOR AND MATERIAL

PROJECT: ____________________________

CONTRACTOR NAME: ____________________________

Pursuant to the provisions set forth in the Instructions to Bidders, The General Conditions, and the Proposal Form, the above-named contractor hereby designates below the names and locations of the place of business of each subcontractor. District may request subcontractor license number.

<table>
<thead>
<tr>
<th>SUBCONTRACTOR</th>
<th>BUSINESS ADDRESS</th>
<th>WORK TO BE DONE</th>
</tr>
</thead>
</table>

Comments:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

END OF DOCUMENT
1.1 TIME OF COMPLETION
A. It is to be understood that time is of the essence for this Contract and the Contractor will be required to perform the Work within the allowable time set forth in the Contract. In this connection, attention is directed to the provisions of the General Conditions and Supplementary General Conditions, if any, relative to delays, extensions of time, and liquidated damages. The successful bidder/contractor shall, within ten (10) days after the Notice of Contract Award, prepare and submit for the Owner’s approval, a Preliminary Construction Schedule. The schedule shall indicate the time of performance and the completion dates of the various portions of the Work, and the dates upon which the Owner may expect to be allowed to occupy all or portions of the Project.

B. The Owner and the Contractor shall agree mutually on any changes in either the schedule or the rate of performance of the Work which might either favorably or adversely affect such schedule dates. No additional compensation or fee shall be paid by the Owner, for any completion of all or any portions of the Work earlier than scheduled unless otherwise specifically noted in Bid Documents.

1.2 PRELIMINARY CONSTRUCTION SCHEDULE
A. The Preliminary Construction Schedule indicates planned Substantial Completion dates for significant activities during the construction period. Substantial Completion of an activity is considered to be when the work of subsequent activities can proceed in accordance with the Project Construction Schedule.

1.3 CONSTRUCTION PROGRESS SCHEDULE
A. A detailed Construction Progress Schedule shall be submitted by the Contractor prior to the submission of the first request for payment. No partial payment on account of work performed shall be made until such detailed Construction Progress Schedule has been approved by the Owner. Refer to Section 01310 for format requirements. Construction sequence or timing of schedules received from contractors may be adjusted in the Project Construction Progress Schedule by the Owner’s Representative to facilitate sequencing and coordination of the overall Project.

B. During the construction period the Contractor is required to regularly provide information and input on scheduling and coordination of his work. The Construction Progress Schedule will detail the Contractor’s performance between Project milestone dates. Construction Progress Schedules will be required with each Contractor’s Application for Payment.

C. The mandatory Project milestones are listed in this section.

PROJECT MILESTONES
A. Bids Due: October 7, 2021 (3:00pm)
B. Notice of Award: October 20, 2021
C. Construction Start: November 8, 2021
D. Substantial Completion: June 30, 2022
E. Final Completion: July 29, 2022
F. Definitions:

1. **Construction Start date:** Established date on which the Contractor shall actively begin the Work on site to be completed under this contract. The construction start date may be amended to permit the Contractor to begin work sooner than established herein, upon approval of the Owner.

2. **Substantial Completion date:** Established date on which the Work, or designated portion(s) thereof, has been sufficiently completed in accordance with the Contract Documents so as to permit the owner to safely and legally occupy or utilize the Work for its intended use, subject only to minor punch list items the absence of completion which does not interfere with the Owner’s intended use of the project.

3. **Final Completion date:** Established date on which all outstanding items of the Work - including activities established in the Contract Documents, punch lists and established closeout documentation – have been fully executed and submitted to the Owner.

1.5 **LIQUIDATED DAMAGES**

A. **Substantial Completion** The Owner and the Contractor agree that this Agreement shall not provide for the imposition of liquidated damages based on the date of Substantial Completion.

1. The contractor understands that if the date of Substantial Completion established by this Agreement (as may be amended by subsequent approved changes) is not attained, the Owner will suffer damages which are difficult to determine and accurately specify. The contractor agrees that if the Date of Substantial Completion is not attained, the Contractor shall pay the Owner actual damages, as determined by actual Owner expenses, to provide for the Project’s intended purpose after the established date of Substantial Completion, up to the date of actual Substantial Completion.

B. **Final Completion** The Owner and the Contractor agree that this agreement shall not provide for the imposition of liquidated damages based on the Date of Final Completion.

1. The Owner, at its election, may choose to execute the completion of outstanding punch list items remaining after the established date of Final Completion. All costs incurred by the Owner for Work completed after the Final Completion date will be deducted from the final payment owed to the contractor.

1.6 **PHASING PLAN**

Phasing of work associated with this Project is not anticipated; however, the District will work with the Contractor to define the final detailed schedule of when work will be permitted and is required to occur.
GENERAL CONTRACTOR AND ALL SUBCONTRACTORS SHALL INCLUDE THE NECESSARY PROJECT MANAGEMENT, LABOR, OVERTIME OR DOUBLE SHIFT REQUIREMENTS TO MEET THE PROJECT’S SUBSTANTIAL COMPLETION DATE. WITHIN LIMITATIONS NOTED BELOW, THE BUILDING IS AVAILABLE 24/7.

General notes:

- Smouse opportunity school will be in use to staff during the duration of the project. Contractor work during work days / school activities shall not restrict full use of the parking lots and building by staff and visitors.

- Work can be done on all days.

- All hauling of equipment and materials in/out and debris removal must insure the safety of the students, staff and visitors. Station personnel at areas of conflict when material or equipment is transferred in and out.

- The contractor may utilize the school parking lot during the summer break.

- Work to be coordinated through the Owner’s representative.

- All existing utility and communication services and distribution systems shall remain active during this work. Should a system be affected due to this work, the contractor shall make any required repairs to the system affected. Systems to maintain include in part: heating and ventilating, plumbing, electrical, temperature controls, fire alarm, security, intercoms, data / communications, and clock systems.

- Temporary security barriers and interior construction barriers shall be installed to separate the school and public from the work areas when rooms with work cannot be secured. All partitions shall be constructed per Section 01500 and shall be from floor to structure above. Maintain and remove the partitions when no longer required. Patch adjacent surfaces as required.

- Emergency exiting as required by the City of Des Moines code officials must be kept available while work continues for the renovation. The contractor shall phase the work around the exits to maintain a level unobstructed path of travel at all times to the public right of way.

- Close Out: Completion of Closeout Documents and punch list. – August 15, 2020 – November 1, 2020. All punch list work shall occur after school hours.

END OF DOCUMENT
# Information Available to Bidders

The following reports are available to bidders for information:

A. Abatement report available by request. Abatement will be performed by owner.

B. The Contractor is hereby notified that some or all of the buildings covered by this Construction Agreement may contain lead-based paint. Some or all of the buildings covered by this Construction Agreement may be considered child occupied facilities as that term is used by the United States Environmental Protection Agency ("EPA") and the Iowa Department of Public Health ("IDPH"). Starting April 2010, federal and state law will require contractors that disturb lead-based paint in homes, child care facilities and schools, built before 1978 to be certified and follow specific practices to prevent lead contamination. Further information regarding these requirements is available on the Iowa Department of Public Health website.

The Contractor is solely and fully responsible for the compliance with all applicable law and regulations regarding lead-based paint, including but not limited to those of EPA, IDPH and OSHA.

# Use of Information

A. All these documents made available by the Owner are for information only and are not a warranty of existing conditions.

B. Bidders may purchase a copy at cost of reproduction.

C. The data contained in the above items have been utilized in the preparation of construction documents. The Contractor may rely on the accuracy of the technical data contained in the report, but not upon non-technical data, interpretations or opinions contained therein, or for the completeness thereof for the Contractor's purposes.

D. Except as indicated in the preceding paragraph, Contractor has full responsibility with respect to subsurface conditions at the site.

END OF DOCUMENT
PART 1 - GENERAL

1.1 PROPOSAL FORMS

A. Bidders are required to use the Proposal Form provided in Document 00311 or submit bid on the DMPS electronic portal. Contact the DMPS Senior Supply Chain Analyst at 515-242-7649 to become registered to submit a bid electronically. Additional proposal forms may be copied from this manual or obtained from the Owner’s Representative.

PART 2 - PROPOSAL FORMAT

2.1 BID PROPOSALS

A. The Proposal consists of all the following required documents:

1. Proposal Form (Document 00311) Inner Envelope.

B. Bid documents shall be enclosed in two envelopes (OUTER and INNER), each of which shall be sealed and clearly labeled “BID DOCUMENTS” and identified with the name and Bid Number of the project; the name and address of the Bidder; and the time or opening bids. The INNER envelope shall contain the Bid Proposal. The OUTER envelope shall contain the Bid Bond and INNER envelope. If all supporting documents are not included, the inner envelope will not be opened.

All information shall be in prominent lettering so as to guard against opening prior to the stipulated time. No responsibility shall attach to any employee of the Owner for the premature opening of any bid not prominently identified. The Bidder shall be responsible for placing his firm name and number, if applicable, of the project and the time of the bidding on the outside of such bid envelope.

C. All spaces provided on the Proposal Forms shall be filled in. If any space provided is not utilized by the Bidder, that space shall be filled in with the notation "NA" (Not Applicable).

D. The Proposal Forms shall be typewritten or manually printed in ink.

E. Where indicated, all amounts shall be expressed in words and in figures. In case of discrepancy, the words shall govern.

F. Bidders shall not make unsolicited notations or statements on the Proposal Forms. Alteration of the Proposal Forms is not permitted and may result in the proposal being considered non-responsive.

G. The person who signs the Proposal shall initial all changes to and erasures of the Bidder’s entries on the Proposal Forms.

H. Each Proposal shall include the legal name of the Bidder and a statement regarding whether the Bidder is a sole proprietor, a partnership, a corporation, or other type of legal entity. Proposals submitted by corporations shall have the state of incorporation noted. Any Bid submitted by an agent shall have a current Power of Attorney attached, certifying the agent’s power to bind the Bidder.

PART 3 - COMPLETION OF PROPOSAL FORMS

3.1 PROPOSAL FORM (DOCUMENT 00311)

A. Submit only one Proposal Form. Copies of the Proposal Form may be made.

B. Fill in the numbers and dates of all Addenda received and considered in the Proposal. Proposals must include acknowledgement of all Addenda issued prior to the Bid Date.
A. Program Description

1. In accordance with the Code of Iowa, Articles 73.15 through 73.21 and as amended by Sec. 223 of House File 479, the Board of Education of the Des Moines Independent Community School District seeks to provide opportunities for Iowa Targeted Small Businesses in the award of all contracts. The Certified Iowa Targeted Small Business participation target is ten percent (10%) of the base bid.

B. Definitions

1. Targeted Small Business (TSB) means a small business which is fifty-one percent or more owned, operated, and actively managed by one or more women or minority persons. Certified in the above context means the TSB has been certified by the Iowa Department of Inspections and Appeals. A complete listing of all certified TSB's may be secured from the Iowa Department of Economic Development (515) 242-4700.

2. Small business means any enterprise located in this state which is operated for profit under a single management, and which has an annual gross income of less than three million dollars computed as the average of the three preceding fiscal years.

3. Minority person(s) means an individual who is Black, Hispanic, Asian or Pacific Islander, American Indian or Alaskan native.

4. Actively managed means exercising the power to make policy decisions affecting the business.

5. Operated means actively involved in the day-to-day management of the business.

C. Performance and Payment Bond Waiver

1. If Contractor is a TSB, the contractor may be eligible to receive a waiver of the performance and payment bond requirements pursuant to the provisions of the Iowa Satisfaction and Performance Bond Program, Section 12.44 of the Code of Iowa.

2. Certification of eligibility to participate in the Iowa Satisfaction and Performance Bond Program is determined by the Iowa Department of Inspection and Appeals.
D. Documentation
   
   To document that a good faith effort has been made to meet the TSB participation goal, each prime bidder shall submit with their bid an executed copy of this form, completely filled out. Make additional copies of the form as required.

E. Place the Contractor’s name at the bottom of each page in the space provided.

F. Date the Form in the spaces provided.

G. Completed TSB form Page 1 must be signed and notarized by the person signing the Proposal Form.

H. Completed TSB forms to be included with the 24 hour information.

3.3 NON-COLLUSION AFFIDAVIT (DOCUMENT 00313)

By signing bid form, bidder acknowledges non-collusion.

A. Submit the Non-Collusion Affidavit on the form provided. Copies may be made.

B. Type or print the signer’s name and title in the spaces provided.

C. Place the Contractor’s name at the bottom of the page in the space provided.

D. Have the Non-Collusion Affidavit Notarized.

E. Completed Non-Collusion Affidavit to be included by low bidder with the 24 HR. information.

3.4 BIDDERS STATUS FORM (DOCUMENT 00314)

Indicate on bid form, bidders residency status.

A. Submit the fully completed Bidders Status Form on the form provided. Copies may be made.

B. Place the Contractor’s name at the bottom of the page in the space provided.

C. Sign and date the Form in the space provided.

D. Completed Bidders Status Form to be included by low bidder along with the 24 Hr. information.

3.5 PERSONNEL ACKNOWLEDGEMENT AND CERTIFICATION (DOCUMENT 00315)

By signing, bidder acknowledges commitment to compliance with all applicable rules, regulations, and restrictions regarding the employment of personnel as defined therein.

A. Submit an executed copy of the Personnel Certification and Acknowledgement form. Copies may be made.

B. Sign and date the Form in the space provided.

C. Completed Bidders Status Form to be included by low bidder along with the 24 Hr. information.

3.6 SUBMISSION OF PROPOSALS

A. Bidders shall bear full responsibility for delivering Proposals to the location for receipt of Proposals by the time and date for receipt of Proposals.

B. Owner will not provide telephones for use by Bidders when preparing their bid.

C. Telephone, faxed or oral bids will not be accepted.
3.7 MODIFICATION OR WITHDRAWAL OF PROPOSALS

A. Any Bidder may withdraw his bid if written request for withdrawal signed in the same manner and by the same person who signed the Bid Form is received by the individual of the School District requesting the bids prior to the time established for the opening of the Bids.

B. No Bidder may withdraw his bid for forty-five (45) days after the scheduled time set for the opening thereof, or before award of the Contract, unless said award is delayed for a period exceeding forty-five (45) calendar days.

C. Proposals that are withdrawn may be resubmitted before the time and date designated for the receipt of Proposals.

D. No oral, telephonic, telegraphic or FAXED modifications will be considered.

END OF DOCUMENT
PROPOSAL FOR: SMOUSE OPPORTUNITY SCHOOL EXTERIOR IMPROVEMENTS

Combined Bid on this form
Awarded contractor will be required to break out costs for each school for contract purpose.

TO: Des Moines Independent Community School District
Operations Center, Supply Chain Analyst, 1917 Dean Avenue
Des Moines, Iowa 50316

COVERING BID NO: B8717

SUBMITTED BY: ___________________________
Name of Bidder

Members of the Board:
The undersigned has carefully examined the site, the proposed Contract Documents prepared by Studio Melee pertinent to the construction of the above referenced Project. Further, being familiar with all other conditions affecting the Work, the undersigned hereby proposes and agrees to furnish and provide all labor, materials, supervision, transportation, tools, equipment, services and other facilities necessary and required for the expeditious completion of the Work indicated above in strict conformity with said conditions and Contract Documents.

The undersigned has reviewed the work outlined in the Bidding Documents and fully understands the scope of work required in this Proposal. The undersigned acknowledges that the Proposal includes the work of all trades required for the work and understands the Owner Representative function as described in the Contract Documents. The undersigned understands that each bidder who is awarded a Contract shall be in fact a Prime Contractor, not a Subcontractor to the Des Moines Independent Community School District. The undersigned agrees that the proposal, if accepted by the Owner, will be the basis for a contract with the Owner to enter into such a contract in accordance with the intent of the Contract Documents.

The undersigned agrees to complete the work required, within the time indicated in the Contract Documents, subject to Liquidated Damages as specified in Documents 00210 and 00700.

The undersigned acknowledges the Iowa - Targeted Small Business program and actively pursued participation (document 00312). Yes ___ No ___ Low bidder to submit completed form with 24 HR. information.

The undersigned certifies that bidder has read and adheres to the terms of the Non-Collusion Affidavit (document 00313). Low bidder to submit completed form with 24 HR. information.

The undersigned has completed the Bidders Status worksheet (document 00314) and certifies the firm to be an Iowa: Resident Bidder _____ Non-resident Bidder _____ Low bidder to submit completed form with 24 HR. information.

Enclosed in a separate envelope is a Bid Security for five percent (5%) of the amount of the Base Bid, made payable to the order of Des Moines Independent Community School District. It is to be left in escrow with the Owner as a guarantee that the undersigned will enter into a Contract and will furnish the specified insurance and bonds. The undersigned has notified the Owner Representative of any discrepancies or omissions, or of any doubt about the meaning of any of the Contract Documents, and has contacted the Owner Representative before bid date to verify the issuing of any clarifying Addenda.

______________________________
Contractor Name

PROPOSAL FORM TO BE SUBMITTED IN INNER ENVELOPE
The undersigned further acknowledges receipt of the following Addenda:

<table>
<thead>
<tr>
<th>NO.</th>
<th>DATE</th>
</tr>
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<tbody>
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</tr>
</tbody>
</table>

BASE BID - BID NO. B8717  SMOUSE OPPORTUNITY SCHOOL EXTERIOR IMPROVEMENTS

The undersigned proposes to provide and construct the Work required, in accordance with said Contract Documents for

the lump sum price of: ________________________________

Dollars ($__________), EXCLUDING ALL SALES TAXES. (Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words shall govern).

SCHEDULE OF ALTERNATES –

Alternate 1: Provide sealant in lieu of new mortar per note 1B on sheet A2.0

The undersigned proposes to provide the work under this alternate as described for the lump sum price of: ________________________________

Dollars ($__________), EXCLUDING ALL SALES TAXES. (Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words shall govern).

Circle one: Deduct  Add

SCHEDULE OF ALLOWANCES –

Allowance No. 1: Quantity Allowance: (200) sq.ft. of re-pointing brick per restoration keynote 1a on construction drawings. ($__________), EXCLUDING ALL SALES TAXES.

Allowance No. 2: Quantity Allowance: (75) lineal feet of stone repointing. ($__________), EXCLUDING ALL SALES TAXES.

Allowance No. 3: (10) lineal feet of steel lintel restoration and paint. ($__________), EXCLUDING ALL SALES TAXES.

Allowance No. 4: Quantity Allowance: (25) lineal feet of sealant replacement for window or masonry. ($__________), EXCLUDING ALL SALES TAXES.

Allowance No. 5: Quantity Allowance: (10) lineal feet of sealant installation were existing mortar joints are removed. ($__________), EXCLUDING ALL SALES TAXES.

Allowance No. 6: Quantity Allowance: (8) lineal feet of stone crack repair ($__________), EXCLUDING ALL SALES TAXES.

Contractor Name

PROPOSAL FORM TO BE SUBMITTED IN INNER ENVELOPE
SMOUSE OPPORTUNITY SCHOOL EXTERIOR IMPROVEMENTS

Allowance No. 7: (5) stone patches ($______________), EXCLUDING ALL SALES TAXES.

SCHEDULE OF UNIT PRICES –

Unit Price 1: Repointing of existing historic brick masonry ($__________) per square foot, EXCLUDING ALL SALES TAXES.

Unit Price No. 2: Repointing of existing historic stone masonry ($__________) per lineal foot, EXCLUDING ALL SALES TAXES.

Unit Price No. 3: Limestone block removal and reinstall ($__________) per block, EXCLUDING ALL SALES TAXES.

Unit Price No. 4: Crack repair of existing historic stone masonry ($__________) per lineal foot, EXCLUDING ALL SALES TAXES.

Unit Price No. 5: Patch of spalling, and plugging holes, in areas of existing historic stone masonry ($__________) per occurrence, EXCLUDING ALL SALES TAXES.

Unit Price No. 6: New sealant joints in brick and stone (in kind) ($__________) per lineal foot, EXCLUDING ALL SALES TAXES.

Unit Price No. 7: New sealant joints in brick and stone (mortar removal) ($__________) per lineal foot, EXCLUDING ALL SALES TAXES.

Unit Price No. 8: Replacement of timber beams indicated on 4/A2.6 (Tudor gable area) ($______________) per board foot, EXCLUDING ALL SALES TAXES.

Unit Price No. 9: Replacement of 1x wood fascia boards or not indicated on drawings ($______________) per lineal foot, EXCLUDING ALL SALES TAXES.

Unit Price No. 10: Steel brick lintels – replacement ($__________) per typical 6 foot wide opening, EXCLUDING ALL SALES TAXES.

Unit Price No. 11: Steel lintel restoration ($__________) per lineal foot, EXCLUDING ALL SALES TAXES.

Unit Price No. 12: Replacement of slate roof shingle ($__________) each tile, EXCLUDING ALL SALES TAXES.

Unit Price No. 13: Removal of metal shingle straps ($__________) each strap, EXCLUDING ALL SALES TAXES.

Unit Price No. 14: Slate tile material ($__________) each tile, EXCLUDING ALL SALES TAXES.

Contractor Name

PROPOSAL FORM TO BE SUBMITTED IN INNER ENVELOPE
LIST OF SUBCONTRACTORS AND SUPPLIERS OF LABOR AND MATERIAL

The lowest bidder for each contract shall, within twenty-four (24) hours following the bid opening, provide the Owner with the List of Subcontractors and Suppliers of Labor and Material. Subcontractor is any entity performing 1-1/2% or more of the contract value. The List shall detail the quotations used in the preparation of the bid and whose services are proposed to be used in construction of the project. The List must be complete showing all sections in the Construction Documents. Failure to submit the List may preclude the bid from further consideration by the Owner. The Owner reserves the right to either disclose or not disclose the List of the successful Bidder.

Each Bidder shall identify and fully disclose on the List all those subcontractors and suppliers proposed for the work with which the Bidder is connected either directly or indirectly as part owner, participant in profits and losses or in any other manner financially or economically.

The forms for the List of Subcontractors and Suppliers of Labor and Materials are included in the Instruction to Bidders, Section 00100.

AGREEMENT

It is understood and agreed that if written notice of the Owner's acceptance of this proposal is mailed, telegraphed, or delivered to the undersigned after the opening of the bid, and within forty-five (45) days, or at any time thereafter before this bid is withdrawn, the undersigned will execute and deliver to the Owner an Agreement in accordance with the bid as accepted. The undersigned will also furnish and deliver to the Owner the Payment Bond, Performance Bond and Certificate of Insurance as specified in the Contract Documents, all within ten (10) working days after receipt of Notice of Contract Award. The work under the Contract shall be commenced by the undersigned bidder, if awarded the Contract, on the date to be stated in a Notice to Proceed, issued to the Contractor and shall be completed by the Contractor in the time specified in the Contract Documents. In the event the bidder to whom an award is made fails or refuses to execute the Contract within the specified time frame; the Owner may declare the bidder's bid security forfeited as damages caused by the failure of the bidder to enter into the Contract.

If this proposal is determined to be (preliminarily) the lowest responsible bid, the undersigned shall submit a listing of subcontractors and major materials suppliers in accordance with G.C. – 27.00 and the Instructions to Bidders within 24 hours of being notified of such finding by the Owner Representative.

The undersigned acknowledges the fact that the Owner reserves the right to accept or reject any and all proposals, to waive any informality in receipt of this proposal, with or without cause or reason, and award the Contract on the basis stated in the Instructions to Bidders.

NOTE: If bidder is a corporation, the legal name of the corporation shall be set forth below, together with the signatures of authorized officers or agents. If bidder is a partnership, the true name of the firm shall be set forth below together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership. If bidder is an individual, his signature shall be placed below.

SUBMITTED BY:

Name of Bidder

Address:

Contractor Name

PROPOSAL FORM TO BE SUBMITTED IN INNER ENVELOPE
Contractor Name: ____________________________

Phone #: ____________________________
Fax #: ____________________________

Contractors, License No.: ____________________________

Signature: ____________________________

License Expiration Date: ____________________________

Position: ____________________________

If Corporation: State of Incorporation: ____________________________

AFFIX CORPORATE SEAL HERE ➔

(If Applicable)

THIS STATEMENT MUST BE NOTARIZED.

STATE OF IOWA, __________ COUNTY, ss:

Subscribed and sworn to before me by the said ____________________________ on this ______ day of ____________, 202_.

Notary Public in and for the State of Iowa

Contractor Name: ____________________________

PROPOSAL FORM TO BE SUBMITTED IN INNER ENVELOPE
If bidder is awarded the contract for this project, the bidder proposes for owner approval the award of a subcontract to the following certified Iowa TSB’s:

(if more room is needed, supply same information on second sheet and attach to this form)

1. __________________________________________________________
   TSB Company Name       Address
   __________________________________________________________ $____________________
   Description of Work     Dollar Amount

2. __________________________________________________________
   TSB Company Name       Address
   __________________________________________________________ $____________________
   Description of Work     Dollar Amount

3. __________________________________________________________
   TSB Company Name       Address
   __________________________________________________________ $____________________
   Description of Work     Dollar Amount

Bidder’s Company Name       Telephone No.

__________________________________________________________
Address       City       State       Zip

__________________________________________________________
Signature (Same person who signs proposal)       Title

__________________________________________________________
Type/Print Name       Date

THIS STATEMENT MUST BE NOTARIZED.

STATE OF ________________, ________________ COUNTY, ss:
Subscribed and sworn to before me by the said ___________________________ on this ________
_______ day of _____________, 202__.

__________________________________________________________
Notary Public in and for the State of __________

______________________________________________
Contractor Name

Low bidder to submit form with 24 HR information
Bidder is _____ / is not _____ a certified Iowa Targeted Small Business, (TSB).

If bidder did not contact any certified Targeted Small Businesses, then state why:

The following TSB's were contacted and declined to participate:

(If more room is needed, supply same information on second sheet and attach to this form)

1. _____________________________________ ___________________________________
   TSB Company Name                        Address
   _____________________________________ ______________________________
   Contact Name                            Date Contacted Telephone No.
   _____________________________________
   Reason given for declining participation

2. _____________________________________ ___________________________________
   TSB Company Name                        Address
   _____________________________________ ______________________________
   Contact Name                            Date Contacted Telephone No.
   _____________________________________
   Reason given for declining participation

3. _____________________________________ ___________________________________
   TSB Company Name                        Address
   _____________________________________ ______________________________
   Contact Name                            Date Contacted Telephone No.
   _____________________________________
   Reason given for declining participation

4. _____________________________________ ___________________________________
   TSB Company Name                        Address
   _____________________________________ ______________________________
   Contact Name                            Date Contacted Telephone No.
   _____________________________________
   Reason given for declining participation

Contractor Name

Low bidder to submit form with 24 HR information
NON-COLLUSION AFFIDAVIT

The Contractor and/or the sub-contractors, as applicable, shall provide this affidavit:

NON-COLLUSION AFFIDAVIT TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID IN OUTER ENVELOPE.

State of Iowa )
) ss.
County of Polk )

being first duly sworn, deposes and says that he or she

(NAME)

is ___________________________ of _______________________________,

(TITLE) (Contractor)

the party making the foregoing bid that the bid is not made in the interest of, or on the behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereto to effectuate a collusive or sham bid."

The undersigned certifies under penalty of perjury that the foregoing is true and correct;

THIS STATEMENT MUST BE NOTARIZED.

NAME OF CONTRACTOR: ________________________________

BY: __________________________________________

Signature Title

______________________________

Type/Print Name Date

STATE OF __________________, COUNTY, ss:

Subscribed and sworn to before me by the said ________________________ on this _____ day of __________, 202_

____________________________________________

Notary Public in and for the State of__________________

LOW BIDDER TO SUBMIT FORM WITH 24 HR INFORMATION

Contractor Name
Bidder Status Form

To be completed by all bidders

Please answer “Yes” or “No” for each of the following:

- **Yes** ☐ **No** ☐ My company is authorized to transact business in Iowa.
  *(To help you determine if your company is authorized, please review the worksheet on the next page).*

- **Yes** ☐ **No** ☐ My company has an office to transact business in Iowa.

- **Yes** ☐ **No** ☐ My company’s office in Iowa is suitable for more than receiving mail, telephone calls, and e-mail.

- **Yes** ☐ **No** ☐ My company has been conducting business in Iowa for at least 3 years prior to the first request for bids on this project.

- **Yes** ☐ **No** ☐ My company is not a subsidiary of another business entity or my company is a subsidiary of another business entity that would qualify as a resident bidder in Iowa.

  If you answered “Yes” for each question above, your company qualifies as a resident bidder. Please complete Parts B and D of this form.

  If you answered “No” to one or more questions above, your company is a nonresident bidder. Please complete Parts C and D of this form.

To be completed by resident bidders

My company has maintained offices in Iowa during the past 3 years at the following addresses:

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<td></td>
<td></td>
<td>City, State, Zip:</td>
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</table>

You may attach additional sheet(s) if needed.

To be completed by non-resident bidders

1. Name of home state or foreign country reported to the Iowa Secretary of State:

2. Does your company’s home state or foreign country offer preferences to resident bidders, resident labor force preferences or any other type of preference to bidders or laborers?  ☐ Yes ☐ No

3. If you answered “Yes” to question 2, identify each preference offered by your company’s home state or foreign country and the appropriate legal citation.

You may attach additional sheet(s) if needed.

To be completed by all bidders

I certify that the statements made on this document are true and complete to the best of my knowledge and I know that my failure to provide accurate and truthful information may be a reason to reject my bid.

Firm Name: ____________________________ Date: ____________________________

Signature: ____________________________ Date: ____________________________

You must submit the completed form to the governmental body requesting bids per 875 Iowa Administrative Code Chapter 156. This form has been approved by the Iowa Labor Commissioner.

309-6001 (09-15)
Worksheet: Authorization to Transact Business

This worksheet may be used to help complete Part A of the Resident Bidder Status form. If at least one of the following describes your business, you are authorized to transact business in Iowa.

☐ Yes  ☐ No  My business is currently registered as a contractor with the Iowa Division of Labor.

☐ Yes  ☐ No  My business is a sole proprietorship and I am an Iowa resident for Iowa income tax purposes.

☐ Yes  ☐ No  My business is a general partnership or joint venture. More than 50 percent of the general partners or joint venture parties are residents of Iowa for Iowa income tax purposes.

☐ Yes  ☐ No  My business is an active corporation with the Iowa Secretary of State and has paid all fees required by the Secretary of State, has filed its most recent biennial report, and has not filed articles of dissolution.

☐ Yes  ☐ No  My business is a corporation whose articles of incorporation are filed in a state other than Iowa, the corporation has received a certificate of authority from the Iowa secretary of state, has filed its most recent biennial report with the secretary of state, and has neither received a certificate of withdrawal from the secretary of state nor had its authority revoked.

☐ Yes  ☐ No  My business is a limited liability partnership which has filed a statement of qualification in this state and the statement has not been canceled.

☐ Yes  ☐ No  My business is a limited liability partnership which has filed a statement of qualification in a state other than Iowa, has filed a statement of foreign qualification in Iowa and a statement of cancellation has not been filed.

☐ Yes  ☐ No  My business is a limited partnership or limited liability limited partnership which has filed a certificate of limited partnership in this state, and has not filed a statement of termination.

☐ Yes  ☐ No  My business is a limited partnership or a limited liability limited partnership whose certificate of limited partnership is filed in a state other than Iowa, the limited partnership or limited liability limited partnership has received notification from the Iowa secretary of state that the application for certificate of authority has been approved and no notice of cancellation has been filed by the limited partnership or the limited liability limited partnership.

☐ Yes  ☐ No  My business is a limited liability company whose certificate of organization is filed in Iowa and has not filed a statement of termination.

☐ Yes  ☐ No  My business is a limited liability company whose certificate of organization is filed in a state other than Iowa, has received a certificate of authority to transact business in Iowa and the certificate has not been revoked or canceled.

[Low Bidder to submit form with 24 HR information.]

309-6001 (09-15)
Acknowledgment & Certification

("Company") is providing services to the Des Moines Independent Community School District ("District") as a Contractor, vendor, supplier, provider or sub-provider and/or is operating or managing the operations of a Contractor, vendor, supplier or provider. The services provided by the Company may involve the presence of the Company’s employees upon the real property of the District.

The Company acknowledges that Iowa law prohibits a sex offender who has been convicted of a sex offense against a minor from being present upon the real property of the District. The Company further acknowledges that, pursuant to Iowa law, a sex offender who has been convicted of a sex offense against a minor shall not operate, manage, be employed by, or act as a Contractor or volunteer at the District.

The Company hereby certifies that no one who is an owner, operator or manager of the Company has been convicted of a sex offense against a minor. The Company further certifies and agrees that it shall not permit any person who is a sex offender convicted of a sex offense against a minor to provide any services to the District in accordance with the prohibitions set forth above.

The Company further certifies that the Company has completed a satisfactory background check on the Company’s employees. The Company hereby agrees to provide the District with the Company’s background screening procedures including specific context and infractions that are reviewed by the Company. The District reserves the right to, but does not have the obligation to, conduct a District background check on Company employees as determined by the District in its sole discretion. The District reserves the right to restrict access of any Company employee upon the real property of the District if such employee does not clear the District’s background check.

The District reserves the right, but does not have the obligation to, to audit the Company’s background screening program at any time, whether announced or unannounced. The Company hereby agrees that the Company shall, upon request, permit an authorized District representative to review background screening records, including those of individual Company employees, in order to conduct a compliance review, audit or investigation, to the fullest extent permitted by law.

The Company shall ensure that the provisions of this Acknowledgement and Certification are extended to any and all subcontractors, consultants, or others the Company may engage if such engagement involves their presence upon the real property of the District.

The Company understands and agrees that violation of any of the provisions of this Acknowledgement and Certification shall constitute sufficient grounds for termination of any contract or subcontract without damages or penalty to the District.

This Acknowledgment and Certification is to be construed under the laws of the State of Iowa. If any portion hereof is held invalid, the balance of the document shall, notwithstanding, continue in full legal force and effect.

In signing this Acknowledgment and Certification, the person signing on behalf of the Company hereby acknowledges that he/she has read this entire document that he/she understands its terms, and that he/she not only has the authority to sign the document on behalf of the Company, but has signed it knowingly and voluntarily.
Signed: ________________________________

Print Name: ______________________________

Title: ________________________________

Date: ________________________________
Draft Policy Regarding Background Checks of Applicants for Employment

The Des Moines Independent Community School District’s primary function is the education and care of the District’s students. The District considers student safety and well-being to be of paramount importance. Because of the requirements of Iowa law, and in order to further these compelling interests, the District’s hiring process includes requests for information regarding an applicant’s past criminal conviction(s). Background checks will be conducted as required by law and District policy/practice. Backgrounds checks will not be performed until a recommendation to hire has been made by the hiring team, after the interview process has occurred.

The District is also committed to equity in its entire employment process, including its hiring process. In order to achieve an equitable process with respect to the consideration of criminal convictions, while promoting the compelling interests of student safety and well-being, the District will consider an applicant’s criminal record in light of the following:

1. All applications will be considered on a case-by-case basis. While the District will endeavor to consider each applicant’s individual situation, it will also attempt to achieve equitable results between similarly-situated applicants.

2. Because honesty and candor are essential to the employer-employee relationship, failure of an applicant to disclose past criminal convictions on their application for employment and/or failure to cooperate with requests from the District to provide additional information necessary to the hiring process will generally result in a denial of employment.

3. Where an applicant’s application and/or background check result in a finding that the applicant has one or more criminal convictions, the District will issue a Pre-Adverse Action Notice to the employee, requesting that the employee provide the District with additional information relating to the conviction(s) prior to the District making a decision relating to the applicant’s employment. The applicant’s cooperation and candor are important if the applicant fails to provide additional information within the time requested, the District will make a decision based on the information available to it. Applicants should be aware that failure to promptly and voluntarily provide additional information will weigh heavily against hiring that applicant.

4. Once the District has received all available information relating to the applicant's criminal background, the District will analyze all available information on a case-by-case basis. Factors examined by the District may include, but are not necessarily limited to all considerations that are job-related and consistent with business necessity, including specifically:
   a. The gravity of the offense/conduct,
   b. Whether the individual has a record of multiple convictions or a documented pattern indicating disregard or the law,
   c. Time since the offense(s),
   d. Whether there are any pending charges at the time of application,
   e. Nature of the job sought,
   f. How the offense(s) relates to the job,
   g. The population the applicant may interact with,
   h. Where applicable, evidence of rehabilitation

5. If the District determines not to move forward with employment, the applicant will receive a Final Adverse Action notice.
6. If an application is rejected due to an applicant’s past criminal conviction(s), that employee may be considered for employment no sooner than seven (7) years from the date of the most recent offense. All decisions will be made based on all information available to the District at the time of the subsequent application.
KNOW ALL PERSONS BY THESE PRESENTS, that we _______________ as Principal, and _______________ as Surety, are held and firmly bound to the Des Moines Independent Community School District, hereinafter called the "School District," in the penal sum of _______________ Dollars ($_____________), in lawful money of the United States, for the payment of which sum will and truly be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly, by these presents. The condition of this obligation is such that whereas the Principal has submitted the accompanying Bid, dated _______________ for the project:

NOW, THEREFORE, if the Principal shall not withdraw said bid within the period specified therein after the opening of the same, or, if no period be specified, within forty-five (45) days after said opening, and shall, within the period specified therefore, or, if no period be specified, within seven (7) days after the prescribed forms are presented for signature, enter into a written Contract with the School District, in accordance with the bid, as accepted, and give bond with good and sufficient Surety or Sureties, as may be required for the faithful performance and proper fulfillment of such Contract, then the above obligation shall be void and of no effect, otherwise to remain in full force and virtue.

By virtue of statutory authority, the full amount of this Bid Bond shall be forfeited to the School District in liquidation of damages sustained in the event that the afore described bidder, Principal, fails to execute the Contract and provide the bond as provided in the Specifications or by law.

IN WITNESS WHEREOF, the parties have executed this instrument under their several seals this the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by the undersigned representatives pursuant to authority of the governing bodies.

(date) Principal
By: __________________________

(date) Surety
By: __________________________

(Attach Power of Attorney of agent executing Bond)

END OF DOCUMENT
1.1 OWNER/CONTRACTOR AGREEMENT

A. The Agreement between the Owner and each Contractor will be written on the Owner's standard Owner/Contractor Agreement Form. A sample of this form appears as Document 00510.

B. The Owner/Contractor Agreement Form will be completed by the Owner and will be sent to the selected Contractor. A minimum of three (3) copies will be prepared for signing.

C. The executed Owner/Contractor Agreement, along with the Contract Documents as defined in Document 00700, will be the entire, integrated Contract between the Owner and each Contractor.

D. Upon receipt of an Owner/Contractor Agreement, the successful Bidder shall review it for completeness and accuracy, execute it, and return it to the Owner.

E. The Owner will execute each Owner/Contractor Agreement after the Bidder and after all required post-bid documents, (see 1.2.C. below), have been submitted.

1.2 NOTICE OF CONTRACT AWARD

A. The Owner shall issue a Notice to Proceed prior to the commencement of work under the Owner/Contractor Agreement.

B. No Contractor shall commence work until all required bonds (Documents 00600, 00610 and 00620) and insurance (Document 00650) have been submitted to and accepted by the Owner.

C. Upon receipt of a Notice toProceed, and receipt of requisite bid documents, each Contractor shall commence work in accordance with the conditions contained in the Notice to Proceed.

END OF DOCUMENT
CONSTRUCTION AGREEMENT

THIS AGREEMENT, made and entered into this ___ day of ______, 202__ by and between DES MOINES INDEPENDENT COMMUNITY SCHOOL DISTRICT (hereinafter designated as the “Owner”), and ____________________________ (hereinafter designated as the “Contractor”), in connection with the construction of ____________ complete with all work appurtenant thereto.

In consideration of the compensation to be paid to the Contractor and of the mutual agreements herein contained, the parties agree as follows:

CA - 1.00 SCOPE OF THE WORK

The Contractor will furnish all tools, equipment, machinery, supplies, superintendence, insurance, transportation and other construction accessories, services and facilities specified or required to be incorporated in and form a permanent part of the completed work. In addition, the contractor shall provide and perform all necessary labor in a good, firm, substantial workmanlike manner and in accordance with the conditions and prices stated in the Bid Proposal and the requirements, stipulations, provisions and conditions of the Contract Documents as defined in the attached General Conditions. Said documents form the contract and are as fully a part thereof as if repeated verbatim herein. The Contractor shall perform, execute, construct and complete all things mentioned as to be done by the him in the Contract Documents, the Owner’s official award of this contract to the Contractor being based on the acceptance by the Owner of the Contractor’s bid, or part thereof.

CA - 2.00 THE CONTRACT DOCUMENTS

The Contract Documents shall consist of this written Agreement, which shall incorporate by this reference all of the instruments set out in Article 1 of the General Conditions as fully as if they were set out in this Agreement in full. All of the said documents and instruments are incorporated into this Agreement by the signature of the parties hereto.

CA - 3.00 TIME OF COMPLETION

The Contractor agrees to commence work under this Agreement by no later than ___________ and to substantially complete all work by no later than ____________.

CA - 4.00 LIQUIDATED DAMAGES

The Contractor understands and agrees that the completion of the entire project within the time provided is an essential feature of this Agreement. The Owner will sustain substantial damages, the amount of which is not possible to accurately determine at this time, if the work is not so completed. The Contractor, therefore, agrees to proceed with due diligence, taking all precautions and making all necessary arrangements to insure the completion of the work within the prescribed time. The Contractor further agrees that should he fail to finally and fully complete the work within the time stipulated, the Owner shall be entitled to collect liquidated damages for the cost of delay, in accordance with the General Conditions of the Contract and as defined in the Contract Documents.

CA - 5.00 CONTRACT SUM

The Owner shall pay to the Contractor for performance of the work encompassed by this Agreement, and the Contractor will accept as full compensation therefor the lump sum of:

See Attachment “A”
subject to adjustment as provided by the Contract Documents, to be paid by progress payments in cash or its equivalent in the manner provided for in the Contract Documents.

CA - 6.00 ACCEPTANCE AND FINAL PAYMENT

A.) Early Release of Retained Funds - Upon Substantial Completion the Contractor may apply for a partial or full release of retained funds. The Contractor, the Architect, and the Owner shall inspect the work covered by the portion of funds requested. When the work is found to be acceptable under the Agreement, including the satisfactory completion of all items covered by the request, the Architect shall promptly certify such to the Owner, over his own signature. The certification shall state that that portion of work provided for in this Agreement has been completed in accordance with the Contract Documents and is accepted by the Architect under the terms and conditions therefore. The Owner shall have the right to withhold 1) an amount equal to 200% of the value of labor and materials yet to be provided on the project as determined by the Owner and its authorized representative and 2) an amount equal to 200% of the value of any Chapter 573 claims currently on file at the time the request for release of retained funds is approved. The balance found to be due the Contractor, and noted in said certificate, shall be due and payable. Approval of the retained balance will be made by resolution of the Owner’s Board of Directors within thirty (30) days, unless otherwise agreed to by the parties.

B) Final Payment of Retained Funds - Upon receipt of written notice that the work is ready for final inspection and acceptance, the Contractor, the Architect, and the Owner shall inspect the work. When the work is found to be acceptable under the Agreement, and the Agreement fully performed, including the satisfactory completion of all punch list items, the Architect shall promptly certify such to the Owner, over his own signature. The certification shall state that the work provided for in this Agreement has been completed in accordance with the Contract Documents and is accepted by the Architect under the terms and conditions therefore. The entire balance found to be due the Contractor, and noted in said final certificate, shall be due and payable. Before issuance of the Owner’s Letter of Acceptance, the Contractor shall submit evidence satisfactory to the Owner that all payrolls, material bills, and other indebtedness connected with the work has been or will promptly be paid.

CA - 7.00 REPRESENTATIONS

The Contractor shall not extend the credit or faith of the Owner to any other persons or organizations.

CA - 8.00 ASSIGNMENT

The Contractor shall not assign all of his rights or obligations under this Agreement without the express written consent of the Owner. Upon any assignment even though consented to by the Owner, the Contractor shall remain liable for the performance of the work under this Agreement.

CA - 9.00 PARTIAL INVALIDITY

If any provisions of this Agreement are in violation of any statute or rule of law of the State of Iowa, then such provisions shall be deemed null and void to the extent that they may be in violation of law without invalidating the remaining provisions hereof.

CA - 10.00 WAIVER

No waiver of any breach of any one of the agreements, terms conditions or covenants of this Agreement by the Owner shall be deemed or imply or constitute a waiver of any other agreement, term, condition or covenant of this Agreement. The failure of the Owner to insist on strict performance of any
agreement, term, condition or covenant, herein set forth, shall not constitute, or be construed as a waiver of the Owner's rights thereafter to enforce any other default; neither shall such failure to insist upon strict performance be deemed sufficient grounds to enable the Contractor to forego or subvert or otherwise disregard any other agreement, term, condition or covenant of this Agreement.

CA - 11.00 ENTIRE AGREEMENT

The within Agreement, together with the Contract Documents as defined in Article 2.00 herein, constitute the entire agreement of the parties hereto. No modification, change, or alteration of the within Agreement shall be of any legal force or effect unless in writing, signed by all the parties hereto.

CA - 12.00 COUNTERPARTS

This Agreement may be executed in several counterparts and each such counterpart shall be deemed an original.

CA - 13.00 GOVERNING LAW

Venue for any and all legal actions regarding or arising out of the transaction covered herein shall be solely in the District Court in and for Polk County, State of Iowa. This transaction shall be governed by the laws of the state of Iowa.

CA - 14.00 ATTORNEYS' FEES

In the event it becomes necessary for either party to enforce any provisions or breach of this Agreement by commencing litigation, the prevailing party in such action shall be entitled to collect, as part of any judgment entered, its reasonable expert witness and attorneys’ fees and costs.

CA - 15.00 NOTICES

All notices, requests, demands and other communications given or to be given under this Agreement shall be in writing. They shall be deemed to have been duly given when served if served personally, or on the second day after mailing if mailed by first class mail, registered or certified, postage prepaid, and properly addressed to the party to whom notice is to be given as set forth below.

If to Owner: DMPS Executive Director of Operations

If to Contractor, then to the individual at the address set forth in the signature block below.

Either party may change its address for purposes of notice by giving written notice to the other party in accordance with this paragraph.

CA - 16.00 BONDS

The Contractor shall furnish both a performance bond and a payment bond and shall pay the premium thereon. The performance bond shall guarantee the full performance of the contract.

CA – 17.00 DESIGNATED REPRESENTATIVE

The OWNER will designate a District representative who will be its authorized representative with the CONTRACTOR under this AGREEMENT.
IN WITNESS WHEREOF, the parties have executed this Agreement on the day and year first above written, and shall extend to and bind the parties, their successors, assigns and personal representatives.

DES MOINES INDEPENDENT COMMUNITY SCHOOL DISTRICT

By:______________________________ ATTEST:______________________________
President, Board of Directors Secretary, Board of Directors

______________________________
Contractor Signature

______________________________

______________________________

Contractor Firm & Address:
Construction Agreement
Des Moines Independent Community School District
(SMOUSE OPPORTUNITY SCHOOL EXTERIOR IMPROVEMENTS)

RE: Award of Bid No.

As recorded in the meeting minutes of the Board of Directors held on _____________, the following is a description of the base bid and alternates proposed by _______________ and accepted by the Board of Directors:

Base Bid:

Alternate

(Contractor Name). bid:

Base Bid: $   

Total Contract Amount: $   

END OF DOCUMENT
1.1 BONDS

A. The Owner shall require the Bidder to whom a Contract is awarded to furnish both Performance and Labor and Material Payment bonds in the amount of one hundred percent, (100%), of the Contract price. Bonds shall cover the faithful performance of the Contract and the payment of all obligations arising thereunder. The Bidder will further provide warranties as required by the specifications or General Conditions.

B. The bonds shall be executed on the forms included with the Contract Documents (forms shall not be removed from the Contract Documents; Bidders shall obtain original copies of the bond forms from the Owner’s Representative). Accompanying each bond form shall be a “Power of Attorney” authorizing the attorney in fact to bind the surety company and certified to include the date of the bond.

C. Performance Bond shall be in the amount of one hundred percent (100%) of the total amount of work covered by this contract. It shall guarantee the faithful performance of the Contractor or manufacturer; and it shall insure the District during the work required by any Contract and for a period of one (1) year from the date of final acceptance of the work, against faulty or improper materials and/or workmanship that may be discovered during that time. If required, warranties extending beyond one years, such as for roofing, shall be as specified in the individual specification sections.

D. Payment Bond shall be in the amount of one hundred percent (100%) of the total amount of work covered by this contract; and shall be in accordance with the law of the State of Iowa to secure the payment of all claims for labor and materials used or consumed in the performance of this Contract.

E. Payment Bonds and Performance Bonds shall include:
   1. Full name and address of Contractor, Surety and Owner
   2. The Contract Date
   3. The exact amount of the Contract
   4. Signature of Contractor
   5. Corporate Seal if applicable
   6. Notarization of Contractor and Surety
   7. Power of Attorney
   8. Local contact for Surety, with name, phone number, and address to which legal notices may be sent.

1.2 BOND COSTS IN BIDS

A. Include all costs for Payment Bonds or Performance Bonds in the bid amounts.

END OF DOCUMENT
LABOR AND MATERIAL PAYMENT BOND

Bond No. _____________

(This Bond is issued simultaneously with a Performance Bond in favor of the Owner conditioned on the full and timely performance of the Contract.)

KNOW ALL MEN BY THESE PRESENTS that ________________________________________________ as Principal (the “Principal”), ____________________________, and a corporation organized and existing under the laws of the State of ________________________, and authorized to transact business in the State of Iowa, as Surety (the “Surety”), jointly and severally bind themselves, their heirs, personal representatives, successors, and assigns, to the DES MOINES INDEPENDENT COMMUNITY SCHOOL DISTRICT, 2100 Fleur Drive, Des Moines, Iowa 50321, as Obligee (the “Owner”), for the use and benefit of it and the claimants as defined below, in the principal amount of ____________________________ ($________________________) as adjusted by approved change orders (not to exceed 10 percent of the principal amount of this Bond unless expressly approved by the Surety, which approval shall not be unreasonably withheld) and interest as provided by law, for the payment of all amounts which become due under the Contract described below.

The Principal and the Owner have entered into a written Construction Agreement dated ________________________, 202__, together with related “Contract Documents” as defined therein (all of which are collectively referred to as the “Contract” and incorporated herein by this reference), for the following Project:

______________________________________________________________________________
______________________________________________________________________________

The condition of this obligation is such that, if the Principal shall at all times promptly make payment of all amounts, claims, or demands lawfully due to all persons, firms, associations, or corporations supplying or furnishing to the Principal or its subcontractors labor or materials, supplies, or equipment which are used, provided, or performed in the prosecution of the work provided for in the Contract and any and all duly authorized modifications of the Contract that may hereafter be made, then this obligation shall be null and void; otherwise, the Surety shall pay the full value of all such claims or demands and shall indemnify and hold the Owner harmless from all payments which the Owner may be required to make under the Contract or applicable law in excess of the Contract price not exceeding the amount of this obligation, together with interest as provided by law, as well as attorneys’ fees and costs incurred by the Owner in the resolution of any claim. All such subcontractors, laborers, and materialmen shall have rights under the within Bond as are set forth in the statutes and laws of the State of Iowa.

Further, each and every claimant, who institutes a lawsuit for compensation or payment under the terms hereof, as part of any court award, shall be entitled to reasonable attorneys’ fees and costs.

The undersigned Surety for value received hereby agrees that no extension of time, change in, addition to, or other modification of the terms of the Contract or work to be performed thereunder, or of the specifications, or of the Contract Documents, shall in any way affect its obligation on this Bond and the Surety hereby waives notice of any such extension of time, change, addition, or modification.
Any notice which any party desires or is required to provide another shall be in writing and shall be effective upon receipt when delivered or transmitted by personal delivery, certified (return receipt) mail, or express mail service to the addresses set forth herein.

IN WITNESS WHEREOF, said Principal and Surety have executed this Bond, this ______ day of ______________________, 202__.

ATTEST:

 Principal

 By:_______________________________________

 Address:__________________________________

 (SEAL)

 ATTEST:

 (Surety)

 By:_______________________________________

 Address:__________________________________

 (SEAL)

 Claims Telephone Number: _______________________

 Claims Fax Number:_________________________

 The fully executed Bond form must be accompanied by a current Power of Attorney.
KNOW ALL MEN BY THESE PRESENTS That ____________________________________________ as Principal (the "Principal"), and ____________________________________________, a corporation organized and existing under the laws of the State of ________________________________, and authorized to transact business in the State of Iowa, as Surety (the "Surety"), jointly and severally, bind themselves, their heirs, personal representatives, successors, and assigns to the DES MOINES INDEPENDENT COMMUNITY SCHOOL DISTRICT, 2100 Fleur Drive, Des Moines, Iowa 50321, as Obligee (the “Owner”), in the principal amount of ____________________________ (__________________________) as adjusted by approved change orders (not to exceed 10 percent of the principal amount of this Bond unless expressly approved by the Surety, which approval shall not be unreasonably withheld) and interest as provided by law (collectively referred to herein as the “Penal Sum”), for the performance of the Construction Agreement between the Principal and the Owner, dated ________________________________, 202__, for the following (Project):

______________________________________________________________________________
______________________________________________________________________________

The condition of this obligation is such that, if the Principal shall at all times duly, promptly, and properly perform all the terms and conditions of the Contract and any authorized modifications thereof during the original term of the Contract, any extensions thereof that may be granted by the Owner, and during the term of any guarantee or warranty required under the Contract, the Principal and Surety shall have no obligation under this Bond, otherwise it shall remain in full force and effect.

The Surety for value received agrees that no extension of time, change in, addition to, or other alteration or modification of the terms of the Contract or work to be performed thereunder, or any other forbearance on the part of either the Owner or the Principal to the other shall in any way release or affect the Surety's liability or obligation on this Bond, and the Surety hereby waives notice of any such extension of time, change, addition, modification, alteration, or forbearance.

Whenever the Owner terminates the Contract in accordance with the terms thereof, the Surety shall, within fifteen (15) calendar days after written notice of such termination, notify the Owner in writing of its election to complete the Contract in accordance with its terms, or notify the Owner that the Surety elects not to complete the Contract. If the Surety fails to give the written notice so required within such fifteen (15) calendar day period, then it will be deemed to have elected not to complete the Contract. Should the Surety elect to complete the Contract, then it shall, within fifteen (15) additional calendar days following written notice of such election, obtain a contractor, subject to approval by the Owner in writing, to complete the original Contract in accordance with its terms and conditions and thereafter proceed with the work with due diligence and make available as the work progresses sufficient funds to pay the cost of completion less the balance of the Contract price. The Surety may not engage the Principal to complete the Contract, without the prior written consent of the Owner, which consent may
be withheld in the Owner’s sole discretion. If the Surety elects to complete the Contract, then it shall be entitled to receive the balance of the Contract price, less (i) any amounts paid by the Owner to the Principal; (ii) costs incurred by the Owner in correcting any defective work; (iii) any additional legal, design professional, and other costs incurred by the Owner resulting from the Principal’s default; and (iv) liquidated damages caused by delayed performance or nonperformance of the Principal. Any progress payments, less retainage, due but not paid at the date of termination shall be paid to the Surety so long as the Surety has agreed to indemnify the Owner for the amount thereof and no other claims have been made to such funds by subcontractors or suppliers in accordance with the Contract or applicable law.

In the event the Surety elects not to complete the Contract, the Owner may then have the work completed by such means and in such manner, by contract with or without public bidding, or otherwise, as it may deem advisable. The Surety in such event shall at all times make available, as work progresses under the Contract between the Owner and its new contractor, sufficient funds, not to exceed the Penal Sum, to pay the cost of the completion of the Contract pursuant to its terms, together with the other amounts set forth in (i) through (iv) above, but in no event shall the Surety be responsible for the payment of any sums to the Owner until the Owner has paid in full its total obligation under the terms of the original Contract, plus change orders, less deductions and claims chargeable by law or by the Contract, if any, and less the retainage which will be disbursed as provided by the Contract Documents and applicable law.

The procedures set forth herein shall apply should there be a default and termination or a succession of defaults and terminations in fulfilling the terms and conditions of the work under the original Contract.

In the event there are negotiations between the Principal and/or the Surety and the Owner subsequent to the date of termination, each party shall appoint an authorized representative with authority to represent it during the negotiations. All written communications and official discussions between the parties shall be conducted by these authorized representatives. Any notice which any party desires or is required to provide another shall be in writing and shall be effective upon receipt when delivered or transmitted by personal delivery, certified (return receipt) mail, or express mail service to the addresses set forth herein.

Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work is located and shall be instituted before the expiration of three (3) years from the date on which final payment under the contract is made; provided, however, that this period may be extended by one (1) additional year by the Owner’s giving written notice to the Surety within the three (3) year period of a potential claim. Any judgment recovered hereunder by the Owner shall include interest at the legal rate, together with reasonable attorneys' fees and costs.
No right action shall accrue under this Bond to or for the use of any person or entity other than the Owner or its successors and assigns.

IN WITNESS WHEREOF, the Principal and Surety have signed this Performance Bond as of the __________ day of __________________, 202__.

ATTEST: ________________________________

Principal

By: _____________________________________

Address: __________________________________

(SEAL) __________________________________________________________________________

ATTEST: ________________________________

(Surety)

By: _____________________________________

Address: __________________________________

(SEAL) __________________________________________________________________________

Claims Telephone Number: __________________________

Claims Fax Number: __________________________

The fully executed bond form must be accompanied by a current Power of Attorney.

END OF DOCUMENT
PART 1 - GENERAL

1.1 INSURANCE CERTIFICATES

A. Each Contractor shall provide insurance certificates to the Owner indicating that all required insurance coverage is in force prior to beginning work on the project.

B. Use a standard Insurance Certificate Form such as the "Acord" Form available from your insurance agent. Also include the Owner, the Architect, and their agents, representatives and employees to be added to the original certificate as additional named insurers.

1.2 CONTRACTOR'S LIABILITY INSURANCE

A. The Contractor shall purchase and maintain liability insurance to protect the Owner and the Architect, and their agents, representatives and employees from claims set forth below which may arise out of or result from the Contractor's operations under the contract whether such operations be by himself or by any subcontractor or by anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable. The insurance required shall include contractual liability insurance applicable to the Contractor's obligations. Insurance requirements are set forth in the General Conditions, Paragraph GC-25.00.

B. The insurance required shall be primary and non-contributory to any insurance possessed or procured by the Owner and limits of liability shall be not less than those set forth.

C. Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the work.

1.3 PROPERTY INSURANCE

A. The Owner will provide property insurance for losses and damages in excess of $100,000.00 in accordance with the General Conditions, Paragraph 25.03 of the contract documents. The contractor shall be responsible for and pay all losses and damages under $100,000.00.

B. The Owner will provide an endorsement listing the Architect as additional insured under all such policies of insurance.

END OF DOCUMENT
## GENERAL CONDITIONS OF THE CONTRACT

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The Work shall be accomplished in accordance with the Contract Documents which shall be included in this Contract and shall consist of the Invitation to Bid, Instructions to Bidders, Bid Security, Proposal, Notice of Contract Award, Insurance Policies and Certificates, Notice to Proceed, Performance Bond, Labor and Material Payment Bond, Construction Agreement, the General Conditions of the Contract, Supplementary General Conditions, drawings and specifications, tests and engineering data, approved change orders, Contractor's Requests for Payment, Architect's Certificates, and all addenda issued by the Owner or Architect prior to the awarding of the Contract.

DEFINITIONS

Words, phrases, and other expressions used in these Contract Documents shall have meanings as follows:

2.01 “Contract” or “Contract Documents” shall include the items enumerated above under CONTRACT DOCUMENTS.

2.02 “Owner” shall mean the Des Moines Independent Community School District, named and designated as such in the Contract Documents acting through its duly authorized representatives.

2.03 “Contractor” shall mean the corporation, company, partnership, firm, entity, or individual named and designated as such in the Contract Documents which has entered directly into this Contract with the Owner for the performance of the Work covered thereby, and any persons or entities acting on its behalf.

2.04 “Subcontractor” shall mean and refer to a corporation, partnership, entity, or individual having a direct contract with the Contractor or another subcontractor for performing work and/or furnishing labor or material which is incorporated into the Work at the request of the Contractor or other subcontractor.

2.05 “Architect” shall mean the architects or engineers designated, appointed, or otherwise employed or delegated by the Owner, or its duly authorized representatives, acting within the scope of the particular duties entrusted to them in each case.

2.06 "Owner's Representative" shall mean the person(s) designated by the District, acting within the scope of the particular duties entrusted to them, to provide services toward the management and implementation of the Work as the Owner's designated representative.

2.07 “Notice to Proceed” shall be deemed to have been duly served if made in writing and delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if sent by registered or certified mail to the last known business address.

2.08 “The Work” shall mean the equipment, supplies, materials, labor, and services to be furnished under the Contract and the carrying out of all obligations imposed or required by the Contract Documents.
2.09 “The Project” is the total construction designed by the Architect of which the work performed under the Contract Documents may be the whole or a part.

2.10 All time limits stated in the Contract Documents are of the essence of the Contract and must be strictly adhered to.

2.11 The Contract shall be governed by the laws of the State of Iowa.

2.12 The date of Final Completion of a Project is the date when construction is certified by the Architect to be finally completed in accordance with Contract Documents, as modified by any change orders agreed to by the parties and when the Owner has fully accepted the Project for the use for which it was intended. Such date will be set forth on a Letter of Final Acceptance issued by the Owner.

2.13 “Drawings” or “plans” shall mean all (a) graphic and pictorial portions of the Contract furnished by the Owner and/or Architect as a basis for the award of Contract; (b) supplementary drawings furnished by the Owner and/or Architect to clarify and to define in greater detail the intent of the Contract drawings and specifications; (c) drawings furnished by the Owner to the Contractor during the progress of the Work; and (d) engineering data and drawings submitted by the Contractor during the progress of the Work, provided such drawings are acceptable to the Architect.

2.14 “Specifications” are the written technical information concerning materials, components, systems, and equipment as indicated on the drawings or plans and which state the quality, performance, characteristics, and installations to be achieved by application of construction methods.

2.15 “Substantial Completion” is:

2.15.1 Established date on which the Work or designated portions thereof has been sufficiently completed in accordance with the Contract Documents so as permit the Owner to safely and legally occupy or utilize the Work for it’s intended use, subject only to minor punch list items the absence of completion which does not interfere with the Owner’s intended use of the Project.

2.15.2 as defined in Iowa Code Chapter 26 for purposes of early release of retainage only.

It is understood and agreed that the written terms and provisions of the Contract Documents shall supersede all oral statements of representatives of the Owner, and oral statements shall not be effective or be construed as being a part of this Contract.

Reference to the standards of any technical society, organization, or association, or to codes of local or state authorities, shall mean the latest standard, code, specification, or tentative standard adopted and published at the date of the Contract Documents unless specifically stated otherwise.
Unless otherwise specifically provided herein, the Contractor shall accept the compensation stated in the Construction Agreement as full payment for furnishing all materials, transportation, apparatus, temporary structures, equipment, services, fuel, energy, light, water, labor, tools and all risks and losses of every kind and description connected with the prosecution of the Work, and all other things necessary for the complete and proper execution of the Work contemplated by or reasonably implied from the Contract Documents, within the time limits indicated therein.

**GC – 6.00 EXECUTION, CORRELATION, INTENT, AND INTERPRETATION OF CONTRACT DOCUMENTS AND COMPLETION DATE**

6.01 **Execution.** The Contract Documents shall be signed in multiple copies as directed by the Owner. Within ten (10) days of Notice of Contract Award, the Contractor shall submit to the Owner a minimum of five (5) fully executed original sets of the Construction Agreement; Performance Bond and Labor and Material Payment Bond with original Power of Attorney; and certificates of required insurance coverages. The date of the Contract for purposes of these documents shall be the date of the Notice of Contract Award letter. The Owner will execute the Construction Agreement, assemble all copies, and distribute the Contract Documents. The Contractor shall not commence the Work until he receives the Notice to Proceed.

6.02 **Correlation.** By submitting the bid, the Contractor represents that he has visited the site, familiarized himself with the local conditions under which the Work is to be performed, and correlated his observations with the requirements of the Contract Documents.

6.03 **Intent.** The intention of the Contract Documents is to include all labor and materials, tools, equipment, construction equipment, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and completion of the Work. Materials or work described in words which as applied have a well-known technical or trade meaning shall be held to refer to such recognized standards.

The organization of the specifications into divisions, sections, and articles, as the case may be, and the arrangement of drawings shall not control the Contractor in dividing the work among subcontractors or in establishing the extent of work to be performed by any trade.

It is intended that even though Work is not covered under any heading, division, section, article, branch, class, or trade of the specifications, it shall nevertheless be supplied if it is required elsewhere in the Contract Documents or is reasonably inferable there from as being necessary to produce the intended results.

The specifications and drawings are intended to supplement but not necessarily duplicate each other/ Any work exhibited in one and not the other shall be executed as if it had been set forth in both, so that the Work will be constructed according to the complete design.

6.04 **Interpretation.** Should anything necessary for a clear understanding of the Work be omitted from the specifications and drawings, or should the requirements appear to be in conflict, the Contractor shall secure written interpretations or instructions from the
Architect before proceeding with the Work affected thereby. It is understood and agreed that the Work shall be performed according to the true intent of the Contract Documents.

Where a conflict occurs between or within standards, specifications, and drawings, the more stringent or higher quality requirements shall apply. The precedence of the Construction Documents is in the following sequence:

1. Addenda to the drawings and specifications take precedence over the original Construction Documents.
2. Specifications take precedence over drawings, except in cases of error.
3. In the drawings, the precedence shall be drawings of larger scale over those of smaller scale and noted materials over graphic indications.
4. Any work mentioned in the specifications and not shown on the drawings or shown on the drawings and not mentioned in the specifications shall be of like effect as if shown or mentioned in both. The Contractor shall examine the specifications and drawings and check all dimensions and notify the Architect and the Owner of any discrepancies between the specifications and drawings and any deficiencies, omissions, or errors before any work is commenced.

6.05 All work on the Project shall be finally completed within the times indicated in the construction documents.

GC - 7.00 DRAWINGS AND SPECIFICATIONS

7.01 Copies Furnished. Unless otherwise provided in the Contract Documents, the Contractor will be furnished, free of charge, all copies of drawings and specifications and addenda reasonably necessary for the execution of the Work.

7.02 Ownership of Drawings. All drawings, specifications, and copies thereof furnished by the Architect are the property of the Owner, whether the work for which they are made is executed or not and are not to be used on other work except by written agreement with the Owner.

7.03 Drawings and Specifications Available on the Site. The Contractor shall maintain at the site for the Owner and the Architect one copy of all drawings, specifications, addenda, approved shop drawings, change orders, and other modifications, in good order and marked to record all changes made during construction. The Contractor shall also keep on the site all applicable standards, codes, manufacturer’s or other specifications referenced in the Contract Documents. The drawings, marked to record all changes made during construction, shall be delivered to the Architect for the Owner upon completion of the Work.

7.04 Figured Dimensions to Govern. Dimensions and elevations shown on the drawings shall be accurately followed. Where dimensions are not indicated, Contractor shall immediately request clarification from the Architect so as not to delay the Work and
Contractor shall not proceed with such work until the necessary dimensions have been obtained from the Architect.

7.05 Contractor to Check Drawings and Schedules. The Contractor shall check all dimensions, elevations, and quantities shown on the drawings and furnished by the Architect, and shall notify the Architect in a timely manner of any discrepancy between the drawings and the conditions on the ground, or any error or omission in drawings, or in the layout as given by stakes, points, or instructions, which he may discover. Before ordering any material or doing any work, the Contractor shall verify all measurements at the building and shall be responsible for the correctness of same. No extra charge or compensation will be allowed on account of difference between actual dimensions and measurements taken in the field. Any difference which may be found shall be submitted to the Architect in a timely manner for consideration before proceeding with the Work. The Contractor will not be allowed to take advantage of any error or omission in the drawings or Contract Documents. Full instructions will be furnished by the Architect should such error or omission be discovered and the Contractor shall carry out such instructions as if originally specified.

7.06 Detail Drawings and Instructions. Upon the contractor's written report, the Architect shall furnish, within 10 working days, additional instructions by means of drawings or otherwise, necessary for the proper execution of the Work. All such drawings and instructions shall be consistent with the Contract Documents, true developments thereof, and reasonably inferable therefrom. The Work shall be executed in conformity therewith, and the Contractor shall do no work without proper drawings and instructions.

7.07 Project Record Drawings. The Contractor shall maintain a Contract set of drawings at the site with all changes or deviations from the original drawings neatly marked thereon in a contrasting color. The Contractor shall also maintain a Contract set of specifications at the site, noting therein by appropriate section, the names, models, and other distinguishing characteristics of the products actually incorporated into the Work. This set of drawings and specifications shall be updated daily as the job progresses and shall be made available to the Owner and Architect for inspection at all times. Upon completion of the Work and before final payment, this Project Record set of drawings and specifications shall be delivered to the Architect.

7.08 Contractors’ Review of Drawings, Plans and Specifications. Contractor’s review of drawings, plans and specifications developed by the Architect and/or the Design Team under this Agreement shall be made in Contractor’s capacity as a contractor and not as a licensed design professional.
8.01 Shop Drawings. Shop drawings are drawings, diagrams, illustrations, schedules, performance charts, brochures, manufacturer's literature, product data, and any other information which are prepared by the Contractor or any subcontractor, manufacturer, supplier, or distributor, and which illustrate some portion of the Work. Said drawings will be submitted in a format agreeable to the Owner and Owner’s Representative.

8.02 Samples. Samples are physical examples furnished by the Contractor to illustrate materials, finishes, equipment, or workmanship, and to establish standards by which the Work will be judged.

8.03 Subcontractor. The Contractor shall require each subcontractor to prepare, stamp with approval, and submit to the Contractor with reasonable promptness and in orderly sequence so as to cause no delay in the Work or in the work of any other subcontractor, all shop drawings and samples on all shop fabricated items and on all matters, required by the Contract Documents or subsequently by the Architect as covered by modifications. Shop drawings and samples will properly identify specified items. At the time of submission, the subcontractor shall inform the Contractor, the Architect and the Owner’s Representative in writing of any deviation in the shop drawings or samples from the requirements of the Contract Documents. Substitutions will be allowed only in accordance with the provisions of Section 36.00 hereinafter.

The Contractor shall also require each subcontractor to prepare and transmit sufficient sets of sepia transparencies, reverse printed, and prints of all shop drawings which are specially drawn for this Project, including detailed fabrication and erection drawings, setting drawings, diagrammatic drawings, material schedules, and samples to the Contractor to meet the Project construction schedule and the subcontractors’ Contract schedule, or shall present, in writing, valid reasons for any delay. Sepias shall not be folded, but shall be rolled and transmitted in a tube suitable for mailing.

All shop drawings for all equipment and/or materials in a given system shall be submitted at one time, each complete set in a separate brochure. Complete maintenance/warranty data are to be submitted to the Contractor for distribution to the Owner’s Representative for review by the Architect and final acceptance by the Owner.

Each sheet of shop drawings shall identify the Project, subcontractor, and fabricator or manufacturer and the date of the drawings. All shop drawings shall be numbered in sequence and each sheet shall indicate the total number of sheets in the set.

The shop drawings shall indicate types, gauges, and finish of all materials. Where a shop coat of paint is required, its brand name, manufacturer's identification number, and type shall be indicated. Sufficient data in each set of shop drawings shall be included to permit a detailed study of the system submitted and its conformance to the Contract Documents and design intent.

The Contractor will review, approve, stamp, and then submit the sepia transparencies, prints, and samples to the Owner’s Representative and Architect for approval with copies.
to the Owner. After review, the Owner’s Representative will then return the sepia transparencies to the Contractor with the Owner’s Representative’s and Architect’s appropriate comments. Those returned for correction shall be corrected and resubmitted. Upon receiving the approved sepia sets from the Owner’s Representative, the Contractor will make requested sets of prints for distribution to appropriate subcontractors, fabricators, manufacturers, and suppliers who require them for coordination of their work.

8.04 Verification. By approving and submitting shop drawings and samples, the Contractor thereby represents that it has determined and verified all field measurements, field construction criteria, dimensions, elevations, quantities, materials, catalog numbers, and similar data, as shown on the drawings and specifications furnished by the Architect and that he has checked and coordinated each shop drawing and sample with the requirements of the Work and of the Contract Documents.

8.05 Architect Review. The Architect will review and approve shop drawings and samples with reasonable promptness so as to cause no delay, but only for conformance with the design concept of the Project and with the information given in the Contract Documents. The Architect’s approval of a separate item shall not indicate approval of an assembly in which the item functions. On the completion of the Work, the Owner’s Representative shall be furnished three corrected copies of all shop or setting drawings showing the as-built condition of the Work. The Owner’s Representative, after the Architect’s review, will furnish one of these copies to the Owner. Architect will keep one copy.

8.06 Corrections. The Contractor shall make any corrections required by the Architect and shall resubmit the required number of corrected copies of shop drawings or new samples until approved. The Contractor shall direct specific attention in writing or on resubmitted shop drawings to revisions other than the corrections requested by the Architect on previous submissions.

8.07 Contractor’s Responsibility. The Architect’s approval of shop drawings or samples shall not relieve the Contractor of responsibility for any deviation from the requirements of the Contract Documents unless the Contractor has informed the Architect in writing in a separate letter attached to the submittal of such deviation at the time of submittal and the Architect has given written approval to the specific deviation, nor shall the Architect’s approval relieve the Contractor from responsibility for errors or omissions in the shop drawings or samples.

8.08 Architect Approval Required. No portion of the Work requiring the submission of a shop drawing or sample shall be commenced until such submittal has been approved by the Architect. All such portions of the Work shall be in accordance with approved shop drawings and samples. All material finishes and samples will be approved at one time. The Contractor shall submit all items requiring approval of finishes, color, material, etc., with sufficient lead time to allow simultaneous consideration and preparation of complete finish Color Schedule. No approvals of single items will be considered.

GC - 9.00 MATERIALS, LABOR, FACILITIES, AND STORAGE
9.01 Contractor’s Responsibility. Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labor, tools, equipment, machinery, transportation, and other facilities necessary for the proper execution and completion of the Work. The Contractor shall provide and pay for all the temporary facilities required to supply all the power, light, water, and heat needed by him and the subcontractors for their work and shall install and maintain all such facilities in such manner as to protect the public and workers and conform with any applicable laws and regulations. If temporary heat and/or protection is required for the expeditious prosecution of the Work and before the permanent heating apparatus is available for use, the temporary heating apparatus shall be installed and operated in such a manner that the finish work and/or construction will not be damaged thereby.

Unless otherwise specified, the Contractor shall pay for all the power, light, and water used by him and the subcontractors, without regard to whether such items are metered by temporary or permanent meters. The cutoff date on permanent meters shall be either the agreed date of full occupancy by the Owner or the date of final acceptance of the Project, whichever shall be the earlier date. Upon completion of the Work, the Contractor shall remove all such temporary facilities from the site.

9.02 Materials. Unless otherwise specified, all materials shall be new and both workmanship and materials shall be of the highest quality. The Contractor shall furnish satisfactory evidence as to the kind and quality of materials. Samples shall be furnished, when specified, and the work shall be in accordance with those samples which have been approved.

9.03 Facilities and Storage. The Contractor shall provide and maintain, in a neat and sanitary condition, adequate temporary toilet facilities for the use of any and all employees engaged on the Work, in strict compliance with the requirements of all applicable codes, regulations, laws, and ordinances. In no event may present toilet facilities of any existing building at the site of the Work be used by employees of the Contractor or subcontractors. Upon completion of the Work, he shall remove all such temporary facilities from the site and disinfect the premises.

The Contractor shall provide suitable temporary facilities and quarters for workmen and shall maintain on premises water-tight storage shed or sheds, tool houses for storage of building materials and tools which may be damaged by weather. The Contractor shall allow space for the erection of sheds and provide similar facilities for storage by subcontractors of their materials and tools. Storage of materials shall be confined to the site. These facilities or quarters shall further provide for protection against theft and damage of building materials and tools. Upon completion of the Work, the Contractor shall remove all such temporary facilities from the site.

The Contractor shall provide adequate, weatherproofed, heated, and well-lighted office space at the site of the Work, for the use of the Architect, Owner’s Representative, and the Owner. The Contractor shall also provide telephone service at such office, which shall be available for the use of the Architect, Owner’s Representative, and the Owner,
without charge, except for toll calls. Requirements of the office space are as listed in Section 01500 paragraph 1.26.

All of the foregoing facilities shall be of a quality and placed in locations acceptable to the Owner and Owner’s Representative.

9.04 Salvage of Materials. Owner reserves the right to salvage any and all materials, equipment, furnishings, and other elements to be removed from the site regardless if such removal is indicated in the plans, specifications, drawings or other Contract Documents.

GC - 10.00 EMPLOYEES

10.00A Qualifications. The Contractor and his subcontractors shall at all times enforce strict discipline and good order among his employees, and shall not employ on the Work any person considered by the Architect, Owner or Owner’s Representative to be unfit or not skilled in the work assigned. The Contractor shall also keep its employees and those of its subcontractor from socializing upon the site of the Work after normal work hours and from fraternizing at any time with staff, students, parents, and other persons who are at the school or the site of the Work.

10.00B No Contractor shall allow any of its employees listed on the Iowa Sex Offender Registry to perform work on District Projects. The District has interpreted an "unfit employee" for purposes of this Contract to be any employee currently listed on the Iowa Sex Offender Registry. The Contractor shall fill out and sign the “Acknowledgement and Certification” form located behind this section prior to executing the Agreement.

10.00C Employee background checks are the responsibility of the Contractor and his subcontractors.

10.01 Drug-Free Zone. The Des Moines Independent Community School District is a drug-free zone. In furtherance of this standard, the Contractor shall establish and maintain a safe and efficient work environment for all employees, free from the effects of alcohol, controlled substances, and illicit drugs. The manufacture, distribution, dispensing, possession, or use of alcohol, controlled substances, and illicit drugs is prohibited on or adjacent to the Project site and all of the Owner’s property at all times. Illicit drug use is the use of illegal drugs and the abuse of alcohol and other drugs, including anabolic steroids. Controlled substances are drugs specifically identified and regulated under state or federal law and include, but are not limited to, opiates, narcotics, cocaine, amphetamines and other stimulants, depressants, hallucinogenic substances, and marijuana. The Contractor will strictly enforce this prohibition among his own employees and his subcontractors and their employees at all times. Employees who violate these prohibitions will be subject to disciplinary action by their employers up to and including termination and may be denied access to the site of the Work. Violation of this provision shall also constitute sufficient grounds for termination of the Contract or any subcontract without damages or penalty to the Owner.

10.02 No Smoking. Statewide smoking ban – Iowa Code Section 142D.3
1. Smoking now is prohibited in all areas of school buildings, including nonpublic schools, as well as all school grounds, parking lots, athletic fields, including inside any vehicle located on school grounds or school parking lots. No longer can a school designate a smoking area.

2. Smoking is prohibited inside all publicly owned vehicles, even if parked in a private drive.

3. Smoking is prohibited inside a private vehicle that is parked in a school parking lot.

The Iowa Department of Public Health (DPH) is in charge of writing administrative rules for the enforcement of this new law. DPH states that it will also provide sample “no smoking” signs that schools may download for free.

4. In addition, the use of tobacco and nicotine products; including, but not limited to, cigarettes, nicotine chew, snus, dissolvables, electronic cigarettes, any electronic or other devices that can be used to deliver nicotine to the person inhaling from the device, any other look-alike products in which the original product would include tobacco and/or nicotine and/or other nicotine products that are not approved by the Federal Drug Administration for tobacco cessation; on District property; including in District buildings, on District grounds, in District transportation vehicles, or at any District activity; is prohibited.

10.03 Equal Opportunity Policy. Because it is the desire of the Des Moines Independent Community School District to encourage equal employment policies, all Contractors, including suppliers supplying goods or services to the School District, are expected to comply with the spirit of equal opportunity employment, as well as with the letter of all applicable statutes and regulations. Compliance shall require Contractor not to discriminate and, in addition, to take reasonable affirmative action to ensure that members of minority groups are effectively accorded equal employment opportunities.

10.04 Responsibility for Employees. The Contractor shall be responsible to the Owner for the acts and omissions of all its employees. The Contractor shall further be responsible for the acts and omissions of all subcontractors, their agents and employees, and all other persons acting on behalf of the Contractor or subcontractors as set forth herein.

GC - 11.00 Royalties and Patents. The Contractor shall pay all royalties and license fees. The Contractor shall defend all suits or claims for infringement of any patent rights and shall hold the Owner harmless from loss on account thereof. If the Contractor has information that the process or article specified is an infringement of a patent, it shall be responsible for such loss unless it promptly gives such information to the Architect and Owner’s Representative.
SURVEYS, PERMITS, LAWS, REGULATIONS, AND TAXES

12.01 **Surveys.** The Contractor shall obtain from the Architect a copy of all surveys provided by the Owner describing property lines, elevation benchmarks, physical characteristics, and utility locations.

12.02 **Permits and Licenses.** General building permit will be secured and paid for by the Owner. Any other permits, governmental fees, and licenses necessary for the proper execution and completion of the Work shall be secured and paid for by the Contractor. Easements for permanent structures or permanent changes in existing facilities shall be secured, maintained and paid for by the Owner, unless otherwise specified. The Owner will negotiate and provide for all electrical, gas, water, and sewer mains for Contractor's connections. The Contractor is to arrange with the utility company for actual connection, make necessary connections, and pay for all inspection fees and permits in connection therewith as required by any governmental agency. In addition, the Contractor will furnish any material or items as required to complete all connections. The Contractor shall call for all required government inspections on a timely basis.

12.03 **Laws and Regulations.** The Contractor shall give all notices and comply with all laws, ordinances, rules, and regulations bearing on the conduct of the Work as drawn and specified. If the Contractor observes that the drawings and specifications are at variance therewith, it shall promptly notify the Architect and the Owner's Representative in writing and any necessary changes shall be adjusted as provided in the Contract for changes in the Work. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules, and regulations, and without such notice to the Architect and the Owner's Representative, it shall bear all costs arising therefrom and to correct same.

12.04 **Taxes.** The Owner is exempt from sales and use taxes (Section 423.3(31) Code of Iowa). The Owner will provide exemption certificates to Contractors for materials to be incorporated into the Project.

The Contractor is subject to payment of Iowa income tax on income from this work in amounts prescribed by law. If the Contractor is a non-Iowa partnership, individual, association, or corporation, it shall furnish evidence prior to the execution of the Contract that bond or securities have been posted with the Iowa State Department of Revenue in the amount required by law.

BENCHMARKS, MONUMENTS, STAKES, AND MEASUREMENTS

13.01 **Benchmarks.** The Contractor shall properly stake out the Work and provide and rigidly set benchmarks and batter boards as necessary for the proper performance of the Work. The Contractor shall remain responsible for their maintenance and their accuracy. A permanent benchmark, approved as to location and type by the Architect, from which all grades are to be taken, shall be established near the site of the Work by the Contractor. From this benchmark the Contractor shall ascertain all grades and levels to the building as needed. The Contract Documents shall include all necessary information to establish the benchmark.
13.02 Preservation of Monuments and Stakes. The Contractor shall carefully preserve all monuments, benchmarks, property markers, reference points, and stakes. In case of his destruction thereof, the Contractor will be charged with the expense of replacement and shall be responsible for any mistake or loss of time that may be caused. Permanent monuments or benchmarks which must be removed or disturbed shall be protected until properly referenced for relocation. The Contractor shall furnish materials and assistance for the proper replacement of such monuments or benchmarks.

13.03 Measurements. Before ordering any material or performing any work, the Contractor shall verify all measurements at the Project and shall be responsible for the accuracy of same. No extra charge or compensation shall be allowed because of any difference between actual dimensions and the measurements indicated in the drawings or specifications. Any discrepancies shall be submitted to the Architect, Owner and Owner’s Representative for consideration before proceeding with the Work.

GC - 14.00 PROTECTION OF WORK AND PROPERTY

The Contractor shall take all necessary precautions for the safety of, and shall provide all necessary protection to prevent damage, injury, or loss to all employees on the Project and all other persons who may be affected thereby; all the Work and all materials and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody, or control of the Contractor or any of its subcontractors; and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

The Contractor shall comply with all applicable provisions of the Occupational Safety and Health Administration (OSHA) and all laws, ordinances, rules, regulations, and orders of any public authority having jurisdiction for the safety of persons or property or to protect them from damage, injury, or loss. It shall erect and maintain all necessary safeguards for the safety and protection of workmen, Owners, and users of adjacent facilities and the public and shall post danger signs and other warnings against hazards created by such features of construction as protruding nails, hoists, well holes, elevator shafts, hatchways, scaffolding, window openings, stairways, excavations, and falling materials; and shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor’s superintendent unless otherwise designated in writing by the Contractor to the Owner’s Representative.

The Contractor is hereby notified that some or all of the buildings covered by this Construction Agreement may contain lead-based paint. Some or all of the buildings covered by this Construction Agreement may be considered "targeted housing" as that term is used by the United States Environmental Protection Agency ("EPA") and the Iowa Department of Public Health ("IDPH"). The scope of work described herein is not "lead abatement" as that term is used by the EPA and IDPH in that the activities included are not designed to permanently eliminate lead-based paint hazards, but are designed to repair, restore or remodel a structure even though the activities may incidentally result in a reduction or elimination of lead-based hazards.

The Contractor is solely and fully responsible for the compliance with all applicable law and regulations regarding lead-based paint, including but not limited to those of EPA, IDPH and OSHA.
SMOUSE OPPORTUNITY SCHOOL EXTERIOR IMPROVEMENTS

The Contractor shall be liable for and shall promptly repair, remedy, indemnify, and pay for all damage or loss to any person or property caused in whole or in part by the Contractor, any subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, except damage or loss proximately caused by faulty drawings or specifications, or to the acts or omissions of the Owner, Owner’s Representative, or Architect and not attributable to any fault or negligence of the Contractor.

In an emergency affecting the safety of life or of the Work or of adjoining property, the Contractor, without special instruction or authorization from the Owner’s Representative, Owner or Architect, is hereby permitted to act, at his discretion, to prevent such threatened loss or injury; and he shall so act, without appeal, if so authorized or instructed. Any compensation, claimed by the Contractor on account of emergency work, shall be determined by agreement. Notification of and report of such emergencies shall be made immediately to the Owner’s Representative, Owner and Architect.

GC - 15.00 ACCESS TO WORK

15.01 Access. The Architect, Owner’s Representative, Owner, and their representatives shall at all times have access to the Work wherever it is in preparation or progress, and the Contractor shall provide proper facilities for such access so that the Architect and Owner’s Representative may perform their functions under the Contract Documents.

15.02 Inspection. If the specifications, the Architect’s instructions, laws, ordinances, or any public authority require any work to be specially tested or approved, the Contractor shall give the Architect and Owner’s Representative timely notice of its readiness for checking by the Architect or inspection by another authority, and if the inspection is by another authority, of the date fixed for such inspection. All required certificates of inspection shall be secured by the Contractor. If any work should be covered up without approval or consent of the Architect, it must, if required by the Architect, be uncovered for examination at the Contractor’s expense.

Re-examination of questioned work may be ordered by the Owner through the Owner’s Representative, and if so ordered, the work must be uncovered by the Contractor. If work is found to be in accordance with the Contract Documents, the Owner shall pay the cost of re-examination and replacement. If such work is found not to be in accordance with the Contract Documents, the Contractor shall pay such cost.

15.03 Testing. Materials incorporated into the Project will be subject to routine tests as required to ensure their compliance with the specifications. Such tests may include, but shall not necessarily be restricted to, the following: Concrete: primary mix design, slump tests, cylinder compressions tests, and air entrainment tests; Steel: tensile tests; Welds: field inspection and x-ray examination; Soils: sub-soil investigation, physical analysis, and compaction tests; Asphalt pavement: physical analysis and compaction tests; and Roofing-Samples cut from in-place built-up roof.

Any other basic materials for which standard laboratory test procedures have been established may also be included if doubt as to their quality should arise.
Any testing of the above nature will be done at the discretion of the Owner who will bear all costs, unless otherwise provided in the Contract Documents. The Contractor shall be held responsible for providing samples of sufficient size for test purposes and for cooperating with the Owner or his representative in obtaining and preparing samples for tests. All tests will be in accordance with standard test procedures and will be performed by persons or firms selected by the Owner.

**GC - 16.00 CONTRACTOR’S SUPERINTENDENCE AND SUPERVISION**

During the progress of the Work, the Contractor shall ensure that a competent superintendent and any necessary assistants, all satisfactory to the Architect, Owner and the Owner’s Representative, are on the Project site at all times while work is in progress. The superintendent shall not be changed by the Contractor except with the consent of the Architect, Owner and Owner’s Representative, unless the superintendent proves to be unsatisfactory to the Contractor and ceases to be in its employ. The superintendent shall represent the Contractor in its absence, and all directions given to the superintendent shall be as binding as if given to the Contractor. The Architect, Owner and Owner’s Representative shall not be responsible for the acts or omissions of the superintendent or the superintendent’s assistants.

The Contractor shall provide full-time, qualified, and efficient supervision of the Work, using competent skill and attention. It shall direct, schedule, and coordinate the Work. It is responsible for determining and supervising all temporary and permanent erection and construction sequences, techniques, means, or methods. It shall coordinate the Work to ensure that all parts fit together properly and in accordance with the Contract Documents. It shall carefully study and compare all Contract Documents and other instructions and shall at once report to the Owner’s Representative any error, inconsistency, or omission which he may discover.

The superintendent shall see that the Work is carried out in accordance with the Contract Documents and in a thorough and first-class manner in every respect. The Contractor shall provide engineering, surveying, and coordination to accurately establish all lines, levels, and marks necessary to facilitate the operations of all concerned in the Contractor’s work. It shall lay out the Work in a manner satisfactory to the Architect, making permanent records of all lines and levels required for excavation, grading, and foundations, and for all other parts of the work. It shall determine the commencement and certify the proper completion of the various stages of construction.

The Contractor shall arrange for the foreman of each subcontractor (mechanical, electrical, masonry, plastering, painting, etc.) on the job to meet with the Owner’s Representative and the Architect at the job prior to any work being started by this particular subcontractor so that all phases of the subcontractor’s work can be thoroughly discussed and the quality of materials and workmanship expected can be completely understood and agreed upon.
17.01 **Field Order Request.** The Owner may, at any time, by a written FOR (Field Order Request) directed through the Architect and Owner’s Representative, without notice to the sureties and without invalidating the Contract, make changes in the drawings and/or specifications of this Contract within the general scope thereof; order extra work; or make changes by altering, adding to, or deducting from the Work. If such changes cause an increase or decrease in Contract amount, an equitable adjustment shall be made and the Contract shall be modified in writing accordingly. Any claim of the Contractor for adjustment under this clause must be asserted in writing within ten (10) days from the date of receipt by the Contractor of the notification of change. No FOR or other form of order or directive by the Owner, Owner’s Representative or Architect requiring additional compensable work to be performed, which causes the aggregate amount payable under the Contract Documents to exceed the amount appropriated for the original Construction Agreement shall be issued unless the Contractor is given written assurance by the Owner that lawful appropriations to cover the costs of the additional work have been made.

Any change or aggregate of changes which causes an increase or decrease greater that 15% of the Contract amount, shall be approved by the Board of Directors in writing.

17.02 **Approvals.** Field orders are to be approved by the Chief Operations Officer, the Architect and the Owner’s Representative. Refer to Section 01028 “Change Procedures” for the requirements associated with documenting Field Order Requests.

17.03 **Minor Changes.** In giving instructions, the Architects shall have authority to make minor changes in the Work, which do not involve extra cost, and which are not inconsistent with the purposes of the building or the Owner’s intent. Architect shall immediately notify Owner and Owner’s Representative in writing of any authorized minor changes in the Work. Otherwise, except in an emergency endangering life or property, no extra work or change shall be made unless in pursuance of a written order from the Owner and Owner’s Representative signed or countersigned by the Architect, or a written order from the Architect stating that the Owner and Owner’s Representative has authorized the extra work or change. No claim for an addition to the Contract sum shall be valid unless ordered or authorized in the manner set forth in this section.

17.04 **Price Differential.** The cost or credit resulting from a change in the Work shall be determined in one or more of the following ways:

a. By estimate, with a detailed cost breakdown as set forth in subparagraph c. below, and acceptance in a lump sum, with a mark-up to the Owner, for the Contractor and all affected subcontractors as outlined in Section 01028 “Change Procedures”.

b. By unit prices named in the Contract or subsequently agreed upon.
c. If the parties are unable to agree on one of the above methods, then the amount shall be determined by force account under the following formula:

i. The actual cost of all direct labor performed (including forepersons employed continuously on the Work, but not the salary, or any part thereof, of the Contractor’s superintendent) and the actual materials furnished for and used in such work, less all available cash, trade, or other discounts;

ii. Rental for the use of such items of equipment as have an individual value in excess of One Thousand Dollars ($1,000); provided that the amount of such rental charge and the length of time and probable cost of the use of such equipment shall have been authorized in writing by the Owner and the Owner’s Representative;

iii. All proportionate sums paid for royalties, permits, and inspection fees;

iv. All proportionate premiums for Public Liability Insurance, Worker’s Compensation, and other proper and necessary insurance, as well as all applicable payroll taxes;

v. Either a predetermined lump sum, fixed fee, or a negotiated percentage fee which fee shall be applied to the total of paragraphs in i., ii., and iii. only, and shall constitute full compensation to the Contractor for all costs and expenses, including all overhead and profit, which are not otherwise enumerated above. Subcontractors, if employed by the Contractor on this part of the Work, will receive such portion of the Contractor’s fee as may be agreed and paid to them by the Contractor.

vi. The Contractor shall keep and present, in such manner as the Owner and Owner’s Representative may direct, an accurate accounting of all of the foregoing costs, together with all supporting vouchers and other documentation, all subject to audit by the Owner.

18.01 Claims for Extra Cost or Time. If the Contractor claims that any instructions by drawings or otherwise, after the date of the Contract, involve extra costs under this Contract which were not included in the original bid, or requires an extension of the Contract time, he shall give the Owner, Architect and Owner’s Representative written notice thereof no later than seven (7) calendar days after the receipt of such instructions, and in any event before proceeding to execute the Work, except in an emergency endangering life or property, and the procedure shall then be as provided for changes in the Work. No such claim shall be valid unless so made. Any change in the Contract amount or Contract time must be authorized by change order. Contractor must list all claims on each Pay Application submitted.

18.02 Delays and Extensions of Time. If the Contractor is delayed at any time in the commencement or progress of the critical path of the Work by any act or neglect of the Owner, Owner’s Representative or the Architect, or by any employee of each, or by any
separate Contractor employed by the Owner, or by changes ordered in the Work, or by unavoidable casualties beyond the Contractor’s control which Contractor could not have avoided by the exercise of diligence, or by any cause which the Owner determines may justify the delay, then the completion date shall be extended in writing by Owner for such reasonable time as the Owner may determine. A time extension shall be Contractor’s sole remedy and compensation for all such delays.

Extension of the Contract completion time will be considered for delays due to weather conditions only when such conditions have had a material, adverse impact upon the critical path of the Construction Progress Schedule, are more unusually severe and extended than could have reasonably been anticipated based upon normal conditions for the relevant period of time, and only if a request for such an extension of time is received within seven (7) days of the first date of each delay. Actual adverse weather delay days must prevent work on critical activities for fifty percent (50%) or more of the Contractor’s scheduled work day. Determination of extension shall be made only after analyzing the ten-year average of data from NOAA and other sources for time period being claimed. Actual days over and above this ten-year average will be considered for time extension.

All requests for extension of time shall be subject to the Owner’s approval and shall be made in writing to the Owner’s Representative no more than seven (7) days after the occurrence causing the delay; otherwise they shall be waived. Any request for extension of time for a change in the Work or for any occurrence allegedly causing a delay as provided for herein must be substantiated by demonstrating the effect of the change or occurrence on the critical path of the Construction Progress Schedule.

If no schedule or agreement is made stating the dates upon which written interpretations or detail drawings shall be furnished, then no claim for delay shall be allowed on account of failure to furnish such interpretations or drawings until fifteen (15) days after demand is made for them, and not then unless such claim is reasonable.

Should the time for completion of the Contract be extended, the Owner reserves the right to occupy any part of the structure upon written notice to the Contractor from the Owner’s Representative, but only after the Architect and Owner’s Representative have made a thorough inspection accompanied by the Contractor’s superintendent to note any defects in workmanship or materials which are the responsibility of the Contractor. Any such partial occupancy shall not be deemed a waiver of any provision for liquidated damages for delay in substantial or final completion, as applicable.

When the whole or a portion of the Work is suspended for any reason, each Contractor shall properly cover over, secure, and protect all work as may be susceptible to damage from any cause.

This Article does not exclude the recovery of damages by the Owner for delay under other provisions of the Contract Documents.
19.01 **Changed Conditions.** The Contractor shall promptly, and before such conditions are disturbed, notify the Owner, Architect and Owner’s Representative in writing of: (1) sub-surface or latent physical conditions at the site differing materially from those indicated in the Contract Documents, or (2) unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents. The Owner, Owner’s Representative and the Architect shall promptly investigate the conditions, and if the Owner finds that such conditions do so materially differ and cause an increase or decrease in the cost of, or the time required for, performance of the Work, an equitable adjustment shall be made and the Contract modified in writing accordingly. Any claim of the Contractor for adjustment hereunder shall not be allowed unless it has given notice as above required.

19.02 **Asbestos and Hazardous Materials.** If the Contractor, Architect or Owner’s Representative encounter or otherwise identify or suspect asbestos, asbestos-containing material, hazardous materials, except for lead-based paint, which is addressed in GC Article 14.00, or other unusual or unexpected conditions, Contractor, Architect or Owner’s Representative shall immediately notify the Owner and shall not continue work on the Project until authorized by Owner in writing.

**GC - 20.00 CORRECTION OF WORK**

20.01 **Correction of Work Before and After Completion.** The Architect, Owner and Owner’s Representative have the authority to reject work which is defective or does not conform to the Contract Documents. The Contractor, following written demand from the Owner’s Representative, shall promptly correct all work rejected by the Architect, Owner’s Representative or Owner as defective or as failing to conform to the Contract Documents whether observed before or after final completion and whether or not fabricated, installed, or completed. The Contractor shall bear all costs of correcting such rejected work, including the cost of the Architect’s, Owner’s Representative’s and/or Owner’s consultant’s additional services. If the Contractor proceeds to build in or cover the item which has been rejected, it shall be totally responsible for the cost of removal and replacement of said item and removal and replacement of all necessary work surrounding or covering the item in order to produce a first-class job.

20.02 **Tests to Determine Conformance.** Whenever in the opinion of the Architect, Owner’s Representative or the Owner, tests are essential to assure the professional evaluation of the Work which is subject to being rejected or condemned, the necessary number of tests will be performed by the consultants designated by the Owner. All parties to the Contract will comply with the methods and extent of the corrections submitted in writing to the Owner, Architect and the Owner’s Representative by the designated consultant. The cost of the tests will become the Contractor’s responsibility when corrections of any nature are recommended by the consultant to the investigated work; otherwise, the Owner will pay for all tests performed. Should such special testing, inspection, or approval be caused by the Contractor’s failure to follow the requirements of the Contract Documents or of required tests under GC-15.03, **Testing**, indicating conditions not in
conformance with the Contract Documents, the costs of such additional testing, inspection, or approval shall be borne by the Contractor, regardless of the results.

20.03 Removal of Rejected Work. The Contractor shall promptly remove from the premises all work rejected by the Architect or Owner as failing to conform to the Contract Documents whether physically in place or not. Thereafter, the Contractor shall promptly replace and re-execute such work in accordance with the Contract and without expense to the Owner. The Contractor shall further bear the expense of making good all work of other subcontractors found to be defective or destroyed or damaged by such removal or replacement.

If the Contractor does not remove such rejected work within a reasonable time, fixed by written notice from the Owner through the Owner’s Representative, the Owner may remove it and may store the material at the expense of the Contractor. If the Contractor does not pay the expenses of such removal within ten (10) days’ time thereafter, the Owner may, upon ten (10) days’ written notice, sell such materials at auction or at private sale. In such case, the Owner shall account to the Contractor for the net proceeds thereof, after deducting all the costs and expenses that should have been borne by the Contractor, including compensation for additional Architect or consultant services. If the net proceeds of sale do not cover all costs which the Contractor should have borne, the difference shall be charged to the Contractor and an appropriate change order shall be issued. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.

20.04 Correction of Work After Final Payment. Neither the final estimate nor payment nor any provision in the Contract Documents shall relieve the Contractor of responsibility for faulty materials or workmanship and, unless otherwise specified, it shall remedy any defects due thereto and pay for any damage to other work or property resulting therefrom, which shall appear within a period of one (1) year from the date of final completion and acceptance. This warranty shall be in addition to and not in lieu of all other remedies available to the Owner.

20.05 Failure to Correct the Work. If the Contractor fails to correct such defective or nonconforming work, the Owner may correct it and otherwise proceed against the Contractor for the cost thereof in accordance with the provisions of these General Conditions.

20.06 Deductions for Uncorrected Work. If the Owner deems it inexpedient to correct work that has been damaged or is defective or has not been completed in accordance with the Contract Documents, an appropriate deduction from the Contract price shall be made and reflected by a change order, or, if the amount is determined after final payment, it shall be paid by the Contractor.

20.07 Additional Obligations. The obligations of the Contractor to correct the Work shall be in addition to, and not in limitation of, any other obligations imposed upon him by law, special guarantees, warranties, or other rights of the Owner.

GC - 21.00 OWNER’S RIGHT TO CARRY OUT WORK
If the Contractor should neglect to prosecute the Work properly or fail to perform any provision of this Contract, the Owner, after three (3) working days’ written notice to the Contractor, may, without prejudice to any other remedy it may have, make good such deficiencies and may deduct the reasonable cost thereof from the payment then or thereafter due the Contractor. In the event such work is performed by the Owner, the Owner’s employees, or by persons other than the Contractor at the Owner’s request, the Owner shall not be liable to the Contractor for inconvenience expense or subsequent cost of removal of such work. The amount to be deducted as cost of doing the Work shall include the cost of the Architect’s additional services made necessary by such default. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.

GC - 22.00 OWNER’S RIGHT TO TERMINATE CONTRACT

22.01 With Cause. If the Contractor should be adjudged a bankrupt; or if it should make a general assignment for the benefit of his creditors without approval of the Owner; or if a receiver should be appointed on account of his insolvency; or if it should refuse or should fail, except in cases for which extension of time is provided, to supply enough properly skilled workers, competent supervision and superintendence of the Work, proper materials, or competent management of the Project; or if it should fail to make prompt payment to subcontractors or for material or labor; or disregard laws, ordinances, or the instructions of the Architect or Owner; or otherwise be guilty of a material violation of any provision of the Contract; then the Owner, when in its sole opinion sufficient cause exists to justify such action, may, without prejudice to any other right or remedy and after giving the Contractor, and his surety, if any, seven (7) days’ written notice, terminate the employment of the Contractor and take possession of the premises and of all materials, tools, and appliances thereon and finish the Work by whatever method the Owner may deem expedient. In such case the Contractor shall not be entitled to receive any further payment until the Work is finally completed and accepted by the Owner. If the unpaid balance of the Contract sum shall exceed the expense of completing the Work, including compensation for additional architectural, managerial, consultant, and administrative services, such excess shall be paid to the Contractor. If such expense shall exceed such unpaid balance, the Contractor shall pay the difference to the Owner. The expense incurred by the Owner, as herein provided, and the damages incurred through the Contractor's default, shall be determined by the Owner.

22.02 Without Cause. Should conditions arise which in the Owner’s opinion make it necessary or advisable to discontinue work under the Contract Documents, the Owner may terminate the Contract in whole or in part without cause or fault by the Contractor by giving seven (7) calendar days’ written notice to the Contractor. The notice shall specify the date and extent to which the Contract is terminated. Upon any such termination, the Owner shall take possession of the site and all or any part of the materials and equipment delivered or en route to the site. In the event of termination under this paragraph 22.02, the Contractor shall be equitably paid for all work properly completed, based upon the approved Schedules of Values.
23.01 **Schedule of Values.** Payments will be made on the valuation of the Work done. Before any Request for Payment will be considered, the Contractor shall submit to the Owner’s Representative a complete, itemized schedule of the values of the various parts of the Work, aggregating the total sum of the Contract and separating material costs from other costs. Such schedule shall include as costs the material costs of all subcontractors under such Contractor and the costs of all materials to be taken from the Contractor’s or subcontractors’ own stocks of material. The schedule shall be submitted on forms supplied by the Owner’s Representative and supported by such evidence as to its correctness as the Owner’s Representative, Architect or the Owner may direct. A separate line item shall be included in the schedule of values for overhead and profit. This schedule will be used for the estimates and payments provided for in these General Conditions. Along with such schedule the Contractor shall submit a schedule of values of estimated monthly application amounts for the course of the Work to assist the Owner in arranging payment.

23.02 **Payments to Contractors.** Payment to the Contractor will be made by the Owner from cash on hand from such sources as may be legally available, and from the proceeds of the Statewide Sales Tax for school infrastructure imposed by the State and authorized by the electors of the Des Moines Independent Community School District by it’s most current Revenue Purpose Statement. Payment shall be made to the Contractor based on monthly estimates in amounts equal to ninety-five percent (95%) of the Contract value of the Work completed, including materials and equipment delivered to the job during the preceding calendar month and will be based upon an Application for Payment prepared by the Contractor, subject to the approval of the Architect. One (1) copy of the Application for Payment shall be filed with the Owner’s Representative. The Architect and Owner’s Representative will certify to the Owner for payment the accuracy of each approved Application for Payment on or before eleven days prior to a regularly scheduled board meeting and within 7 working days. Such monthly payments shall in no way be construed as an act of acceptance for any part of the Work partially or totally completed. It is the policy of the Board of Directors of the Owner to schedule Certificates of Payment and accounting times to coincide with the regular meetings of the Board and to pay Contractor no more often than once per month. The Owner reserves the right to withhold payments at any time regardless of the Architect’s or Owner’s Representative’s recommendations.

The Contractor warrants and guarantees that title to all work, materials, and equipment covered by an Application for Payment, whether incorporated in the Project or not, will pass to the Owner upon the receipt of such payment by the Contractor, free and clear of all liens, claims, security interests, or encumbrances; and that no work, materials, or equipment covered by a Request for Payment will have been acquired by the Contractor or by any other person performing the Work at the site or furnishing materials and equipment for the Project, subject to an agreement under which an interest therein or an encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person. This provision shall not be construed as relieving the Contractor from the sole responsibility for all materials and work upon which payments
have been made or the restoration of any damaged work or as a waiver of the right of the Owner to require the fulfillment of all the terms of the Contract.

23.03 **Document Submission.** Contractor shall be responsible for submitting all required Contract Documents and Applications for Payment in forms acceptable to the Owner, including but not limited to, electronic submission.

23.04 **Applications for Payment.** No Application for Payment will be submitted to the Owner until and unless the Architect and Owner’s Representative have certified it. No approval of a progress payment, nor any progress payment, nor any partial or entire use or occupancy of the Project by the Owner shall constitute an acceptance of any work not completed in accordance with the Contract Documents.

23.05 **Payments Withheld.** The Owner may withhold payment or the Architect may decline to approve an Application for Payment in whole or in part, or the Architect may withhold or nullify the whole or any part of any Application previously issued, because of subsequently discovered evidence or subsequent inspections, for such an amount or to such extent as may be necessary in the opinion of either to protect the Owner from loss on account of:

a. Defective work not remedied;

b. A reasonable doubt that the Contract can be completed for the balance then unpaid;

c. Damage to another Contractor;

d. Failure of the Contractor to prosecute any portion of the Work in a timely manner or in compliance with any approved schedules;

e. Failure of the Contractor to submit on a timely basis any documentation required by the Contract Documents, including, without limitation, monthly progress reports, schedule of values, potential claims or request for approval of subcontractors.

**GC - 24.00 CONSTRUCTION SCHEDULE AND PROGRESS REPORTS**

All time limits stated in the Contract Documents are of the essence of the Contract.

All work on the Project shall be finally completed within the times indicated in the Construction Documents.

The Contractor shall submit, within ten (10) calendar days after the date of the Notice of Contract Award in a format acceptable to the Owner, a Preliminary Construction Schedule for the Project. This schedule shall start with the date of the Notice of Contract Award, and the completion date shall be a date which will enable the Owner to accept the Work on the date specified in the Construction Agreement.

Contractor shall submit a detailed Construction Progress Schedule prior to the first application for payment. The schedule shall portray fully a timetable representing the various elements in the schedule of values and shall provide for the expeditious and practicable execution of the Work. The time shown between the starting and completion dates of the various elements within the schedule shall represent
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one hundred percent (100%) completion of each element. The detailed Construction Progress Schedule shall indicate the critical path of the Work. This schedule shall be revised monthly during the progress of the Work. Monthly updates of the schedule shall be required as a Condition of Approval for the Contractor’s Application for Payment. Additional detailed schedules of separate elements of the Work may be requested at the Owner’s discretion.

In addition, the Contractor shall submit with the Request for Payment monthly progress reports. Basically, these reports shall reflect the Contractor’s “work in place” progress and will be certified by the Contractor or its superintendent as to the date and contents of such “work in place” progress report. If requested by the Owner, the monthly progress reports shall also include representative photographs of the actual work in place. Such reports shall depict progress and percentage of completion, consistent with the values and amounts contained on the counterpart Request for Payment. The subcontractors shall be supplied copies of the Contractor’s approved schedule. These subcontractors shall develop a similar schedule based on their respective work. Failure to submit an approved progress schedule or monthly progress report shall be deemed cause to reject Requests for Payment.

The Contractor shall schedule all work so as to reduce to a minimum any disruption in the use of the existing facilities and interruptions of utility service of any type. Where electrical or mechanical work performed under this Contract will necessitate interruptions of service to existing facilities, the Contractor shall furnish and install temporary service to such facilities or perform such work at such times when said existing utilities are not in normal use. This Contractor shall bear the cost of all overtime or inconvenience resulting therefrom.

25.00 INSURANCE

The Contractor shall purchase and maintain such insurance as will protect it from claims set forth below which may arise out of or result from the Contractor’s operations under the Contract, whether such operations be by himself or by any subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. All such insurance shall be subject to the approval of the Owner for adequacy of protection, and shall include a provision preventing cancellation without thirty (30) days’ prior notice to the Owner in writing.

25.01 Liability Insurance Requirements. The Contractor shall procure and maintain, at its own expense, until final completion and acceptance by the Owner, liability insurance as hereinafter specified. The liability insurance required is as follows:

a. Commercial General Liability Insurance. Contractor’s General Public Liability and Property Damage Insurance issued to the Contractor and protecting it from all claims for personal injury, including death and all claims for destruction of or damage to property arising out of or in connection with any operations under his Contract, whether such operations be by himself or by a subcontractor under him, or anyone directly or indirectly employed by the Contractor or by a subcontractor under him, or by anyone for whose acts any of them may be liable.

All such insurance shall be written with a limit of liability of not less than $1,000,000 for all damages arising out of one occurrence for bodily injury, including death, and property damage. The General Liability policy should have a general aggregate limit of $2,000,000 for all damages and a products completed aggregate of $2,000,000.
for all damages. The policy should be endorsed to provide the designated construction Project general aggregate endorsement showing the address of the Project covered by this agreement.

All such insurance shall be written on a comprehensive policy form and shall specifically cover all blasting operations, elevators, products, completed operations, explosions, collapse, subsidence, and underground damage. Certificates evidencing the issuance of such insurance, addressed to the Owner, shall be filed with the Owner and Owner’s Representative within ten (10) days after the date of the Notice of Contract Award.

b. The policy shall include the Owner and Owner’s Representative as an additional insured. The insurer shall give the Owner and Owner’s Representative notification of any cancellation or termination by refusal to renew the policy or of any change in coverage of the policy in the manner provided by law. If no such notification is provided by law, the insurer shall give the Owner and the Owner’s Representative at least thirty (30) days’ prior written notification of any cancellation or termination by refusal to renew the policy or of any change in coverage of the policy.

25.02 Worker’s Compensation Insurance. The Contractor shall maintain at his own expense, until completion of the Work and Final Acceptance thereof by the Owner, Worker's Compensation Insurance, including occupational disease provisions, covering the obligations of the Contractor in accordance with the provisions of the laws of the State of Iowa. The Contractor shall furnish the Owner with a certificate giving evidence that the Contractor is covered by the Worker's Compensation Insurance herein required, each certificate specifically stating that such insurance includes occupational disease provisions. All such certificates shall be furnished within ten (10) days after the date of the Notice of Award. This policy should also include Employer’s Liability Insurance with minimum limits of $500,000 each accident for bodily injury, $500,000 each accident for bodily injury by disease, and $500,000 policy limit for bodily injury by disease.

25.03 Property Insurance. The Owner shall pay for and maintain Property Insurance, covering property of every kind and description to be incorporated into the Work, including materials and supplies, used or to be used, as part of or incidental to the construction operations. The insurance shall exclude the Contractor’s and its subcontractors’ equipment, tools, and machinery, which are not incorporated into the Work. The Property insurance shall be written under a ‘Special Cause of Loss Form’ to include perils of fire, lightning, windstorm, vandalism, and theft, as well as other perils normally covered by the standard Insurance Service Office Special Cause of Loss Form.

A loss insured under the Owner’s Property Insurance shall be adjusted by the Owner and made payable to the Owner on behalf of the Contractor and its subcontractors as their interests may appear. The Contractor shall pay subcontractors their just portions of any insurance proceeds received by the Owner and paid to the Contractor.

Unless the Owner agrees otherwise, in writing, all monies received shall be applied toward rebuilding or repairing the destroyed or damaged work.
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The Owner, Contractor, its subcontractors and suppliers waive all rights against each other for damages caused by fire or other perils to the extent covered by the Property Insurance (for damages in excess of $100,000.00) obtained pursuant to this section or other property insurance applicable to the Work, except such rights as they may have to the proceeds of such insurance held by the Owner on their behalf. The Contractor shall require similar waivers of his subcontractors, sub-subcontractors, agents, and employees of any of them.

The deductible will be $100,000.00. Contractor is responsible for all losses and damages less than the deductible.

25.04 Installation Floater. The Contractor shall maintain an Installation Floater policy and Builder’s Risk policy covering the Work and Materials not yet installed in the building or not otherwise covered by Builders Risk insurance. The Floater should have a minimum limit of $100,000. The Floater shall cover the following areas:

A. Property in transit; and
B. Property stored off-site at a temporary location.

25.05 Comprehensive Automobile Liability. The Contractor shall pay for and maintain Comprehensive Automobile Liability Insurance, including owned, non-owned, and hired vehicles in the following amounts:

Bodily Injury and Property Damage: $1,000,000 combined single limit

25.06 All liability policies which include the Owner as an additional insured shall include a Governmental Immunities Endorsement (See the Standard Endorsements Figure 1070.5), pursuant to Chapter 670.4 of the Iowa Code, which endorsement shall include the following provisions:

a. Nonwaiver of Government Immunity. The insurance carrier expressly agrees and states that the purchase of this policy and including the Owner as an Additional Insured does not waive any of the defenses of governmental immunity available to the Owner under Iowa Code Section 670.4 as it now exists and as it may be amended from time to time.

b. Claims Coverage. The insurance carrier further agrees that this policy of insurance shall cover only those claims not subject to the defenses of governmental immunity under Iowa Code Section 670.4 as it now exists and as it may be amended from time to time.

c. Assertion of Government Immunity. The Owner shall be responsible for asserting any defense of governmental immunity, and may do so at any time and shall do so upon the timely written request of the insurance carrier.

d. Non-Denial of Coverage. The insurance carrier shall not deny coverage or deny any of the rights and benefits accruing to the Owner under this policy for reasons of governmental immunity unless and until a court of competent jurisdiction has ruled in favor of the defense(s) of governmental immunity asserted by the Owner.
This Government Immunities Endorsement shall be included on all Insurance policies which include the Owner as Additional Insured.

25.07 Cancellation and Insurance Companies. All policies of insurance carried by the Contractor shall provide for 30 days advance written notice of cancellation, non-renewal, or material change in insurance coverage directed to the Des Moines Independent Community School District. The Owner will accept the policies written only by sureties legally authorized in the State of Iowa.

25.08 The Contractor and its subcontractors, sub-subcontractors and their supplies are responsible for all damage to their own tools, equipment, and vehicles of every type. The Contractor, its subcontractors, sub-subcontractors and their suppliers shall waive subrogation against the Owner for any damage to such equipment, tools, and vehicles including any insurance in force to cover such equipment.

GC - 26.00 PERFORMANCE AND PAYMENT BONDS

The Contractor shall, within ten (10) days of the Notice of Contract Award, furnish bonds to the Owner in the full amount of the Contract price, covering both the faithful performance of the Contract and the payment of all obligations for labor and materials arising thereunder, on such forms as the Owner may prescribe and with such sureties as the Owner may approve. Such bonds shall be duly executed by a qualified surety, conditioned upon the true and faithful performance of the Contract, and shall provide that if the Contractor or his subcontractors fail to duly pay for any labor, materials, or other supplies used or consumed by such Contractor or his subcontractors in the performance of the Work contracted to be done, the surety will pay the same in an amount not exceeding the sum specified in the bond, as adjusted by approved change orders, and together with interest as provided by law. The Performance Bond shall additionally guarantee that the Contractor shall remedy any omissions, correct any and all defects, and adjust and make operable all component parts of the Work falling under the requirements of his Contract which may be called to his attention within a period of twelve (12) months following the date of the Letter of Acceptance.

The premium for all bonds shall be paid by the Contractor and included in the bid price in the Bid Proposal. The Owner will accept and approve bonds written by sureties legally authorized to write such bonds in the State of Iowa. If, at any time a surety on such a bond becomes irresponsible or loses its right to do business in the State of Iowa, the Owner may require another surety acceptable to the Owner, which the Contractor shall furnish within ten (10) days after receipt of written notice to do so.

GC - 27.00 SUBCONTRACTORS

The Contractor shall, within twenty-four (24) hours following the bid opening, provide to the Owner a completed List of Subcontractors and Suppliers of Labor and Material, which details whose quotations it has used in preparation of his bid. The Contractor shall, before awarding any subcontracts, re-verify to the Owner and Architect in writing the names of subcontractors proposed for the Project. Any deviation from the original subcontractor and supplier list will not be allowed unless justification is submitted in writing to the Owner by the Contractor that the subcontractor or supplier is deemed unfit or unable to perform the specified work, is unwilling to enter into a subcontract, or is not in compliance with the
The Contractor shall not employ any subcontractors that the Owner or Architect may, within a reasonable time, object to as incompetent, unfit, or otherwise undesirable. Substitutions of subcontractors listed in the executed proposal form may not be made without written approval of the Owner.

The Owner shall, on request, furnish to a subcontractor, wherever practicable, evidence of the amounts certified on his account.

The Contractor agrees that it is as fully responsible to the Owner for the acts and omissions of his subcontractors and of persons either directly or indirectly employed by them, as it is for the acts and omissions of persons directly employed by it.

The Contractor, at the conclusion of the Work and before final payment is made, shall furnish to the Owner a listing, giving names, contact persons, addresses, and telephone numbers of all subcontractors and material suppliers who furnished labor and materials on the Project with identification of the services rendered and materials provided.

Nothing contained in the Contract Documents shall create any direct contractual relation between any subcontractor and the Owner.

GC - 28.00 RELATIONS OF CONTRACTOR AND SUBCONTRACTOR

The Contractor agrees to bind every subcontractor by a written agreement and require in his Contracts that every subcontractor be bound by the terms of the Construction Agreement, the General Conditions of the Contract, the Supplementary General Conditions, the drawings and specifications as far as applicable to his work, including the following provisions of this Article, unless specifically noted to the contrary in a subcontract approved in writing as adequate by the Owner.

The subcontractor agrees with the Contractor:

a. To be bound to the Contractor by the terms of the Construction Agreement, General Conditions of the Contract, the Supplementary General Conditions, the drawings and specifications, and any other Contract Documents, and to assume toward it all the obligations and responsibilities that it, by those documents, assumes toward the Owner;

b. To preserve and protect the rights of the Owner and the Architect under the Contract with respect to the Work to be performed under the subcontract so that the subcontracting thereof will not prejudice such rights;

c. To perform all Work in accordance with the requirements of the Contract Documents;

d. To submit to the Contractor applications for payment in such reasonable time as to enable the Contractor to apply for payment as specified in the General Conditions;

e. To make all claims for extras, for extensions of time, and for damages for delays or otherwise, to the Contractor in the manner provided in the General Conditions of the Contract and the Supplementary General Conditions for like claims by the Contractor upon the Owner, except that the time for making claims for extra cost is one week.

The Contractor agrees:
f. To be bound to the subcontractor by all the obligations that the Owner assumes to the Contractor under the Agreement, General Conditions of the Contract, the Supplementary General Conditions, the drawings and specifications, and by all the provisions thereof affording remedies and redress to the Contractor from the Owner.

g. To pay the subcontractor not later than seven (7) calendar days immediately following the payment of each certificate issued under the schedule of values described in these General Conditions, the amount allowed to the Contractor on account of the subcontractor’s work to the extent of the subcontractor’s interest therein.

h. To pay the subcontractor, upon the payment of Certificates, if issued otherwise than as in g. above, so that at all times his total payments shall be as large in proportion to the value of the Work done by it as the total amount certified to the Contractor is to the value of the Work done by it.

i. To pay the subcontractor to such extent as may be provided by the Contract Documents or the subcontract, if either of these provides for earlier or larger payments than the above.

j. To pay the subcontractor a just share of any insurance payment received by the Contractor, applicable to work performed by such subcontractor.

If the Owner knows or has reason to know the Contractor is not making timely payments to the subcontractors and/or suppliers, the Owner may require the Contractor to submit verified documentation evidencing that full and timely payments have been made to the subcontractors and suppliers and/or that legal justification exists for withholding payments. In addition, the Owner may contact the subcontractors and suppliers directly to obtain verification that payments have been made as required by law or the Contract Documents.

Nothing in this Article shall create any obligation on the part of the Owner to pay or to see to the payment of any sums to any subcontractor, nor shall it form the basis for any action by the subcontractor against the Owner on any contractual theories.

GC - 29.00 ARCHITECT’S STATUS AND INSPECTIONS

29.01 Authority. The Architect shall act on the Owner’s behalf through the Owner’s Representative during construction and until the expiration of the warranty period. The Architect has the authority to act on behalf of the Owner only to the extent expressly provided in the Contract Documents or otherwise in writing. The Architect, with written approval of the Owner, shall have authority through the Owner’s Representative to stop the Work whenever such stoppage may be necessary in the Architect’s reasonable opinion to ensure the proper execution of the Contract.

29.02 Decisions. The Architect shall be, in the first instance, the interpreter of the conditions of the Contract and the judge of its performance, although the Owner shall retain the final authority in decisions regarding such matters. The Architect shall, within a reasonable time, make recommendations to the Owner’s Representative on all claims of the
Contractor and on all other matters relating to the execution and progress of the Work. All such decisions shall be subject to review by the Owner. The Architect’s decisions in matters relating to artistic effect, after consultation with the Owner, shall be final, if within the terms of the Contract Documents.

29.03 **Inspections.** The Contractor shall provide timely notice to the Owner, Owner’s Representative and the Architect when inspections are desirable or required by the terms of the Contract or the Architect’s and Owner’s Representative’s agreement with the Owner. Such notice shall be given in order to allow for the following reviews and inspections, among others:

a. Reviewing and approving shop drawings samples and other submissions for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents;

b. Inspection of bearing surfaces of excavations before footings are poured;

c. Inspection of reinforcing steel after installation and before concrete is placed;

d. Inspection of structural and architectural concrete before, during, and after pouring;

e. Evaluation of all laboratory reports;

f. Inspection of structural steel after erection and prior to its being covered or enclosed;

g. Inspection of mechanical work following its installation and prior to its being covered and enclosed;

h. Inspection of electrical work following its installation and prior to its being covered or enclosed; and

i. Inspection of exposed surfaces for compliance with the Construction Documents.
30.01 Authority. The Owner’s Representative shall be the District’s principal agent and shall act on the Owner’s behalf through the Program during construction and until the expiration of the warranty period. The Owner’s Representative has the authority to act on behalf of the Owner to the extent expressly authorized in the Contract Documents or otherwise expressed in writing. The Owner’s Representative, with written approval of the Owner, shall have authority to stop the Work whenever such stoppage may be necessary in the Owner’s Representative’s reasonable opinion to ensure the proper execution of the Contract.

30.02 Administration. The Owner’s Representative shall establish and implement procedures for reviewing and processing requests and making recommendations to the Owner and Architect with respect to clarifications and interpretations of the Contract Documents; shop drawings; samples and other submittals; contract schedule adjustments; change order and field order proposals; written proposals for substitutions; payment applications; and the maintenance of logs. Although the Owner shall retain the final authority in decisions regarding such matters, as the Owner’s representative, the Owner’s Representative shall be the party to whom all such information shall be submitted. The Owner’s Representative’s recommendation to the Owner shall relate to design considerations, matters of cost, scheduling and time of construction, and clarity, consistency and coordination of documentation.

30.03 Inspections. The Contractor shall provide timely notice to the Owner, Owner’s Representative and the Architect when inspections are desirable or required by the terms of the Contract or the Architect’s and Owner’s Representative’s agreement with the Owner. Such notice shall be given in order to allow for the following reviews and inspections, among others:

a. Reviewing and approving shop drawings, samples, product data and other submissions for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents;

b. Inspection of bearing surfaces of excavations before footings are poured;

c. Inspection of reinforcing steel after installation and before concrete is placed;

d. Inspection of structural and architectural concrete before, during, and after pouring;

e. Evaluation of all laboratory reports;

f. Inspection of structural steel after erection and prior to its being covered or enclosed;

g. Inspection of mechanical work following its installation and prior to its being covered and enclosed;

h. Inspection of electrical work following its installation and prior to its being covered or enclosed; and
i. Inspection of exposed surfaces for compliance with the Construction Documents.

j. Reviewing Project schedules and schedule changes.

k. Reviewing requests for change in the Contract including all change Orders and Field Orders.

l. Reviewing and making recommendations for pay requests.

m. Reviewing certificates and policies of insurance for compliance with the Contract Documents.

n. Inspecting the site for construction observations and supervision and preparing written and photographic documentation.

GC - 31.00 CASH ALLOWANCES

The Contractor shall include in the Contract sum all allowances stated in the Contract Documents. These allowances shall cover the net cost of the materials and equipment delivered and unloaded at the site, and all applicable taxes. The Contractor's handling costs on the site, labor, installation costs, overhead, profit, and other expenses contemplated for the original allowance shall be included in the Contract sum and not in the allowance. The Contractor shall cause the Work covered by these allowances to be performed for such amounts and by such persons as the Owner or Architect may direct through the Owner’s Representative, but it will not be required to employ persons against whom it makes a reasonable objection. If the cost, when determined, is more than or less than the allowance, the Contract sum shall be adjusted accordingly by field order which will include additional handling costs on the site, labor, installation costs, overhead, profit, and other expenses resulting to the Contractor from any increase over the original allowance.

GC - 32.00 USE OF PREMISES

The Contractor shall confine its apparatus, the storage of materials, and the operations of its workers to limits indicated by law, ordinances, permits, and the Contract Documents, and shall not unreasonably encumber the premises with its materials. Contractor shall not place or store any materials, equipment, or other items or goods outside the construction area as designated in the Construction Documents, without prior written approval of the Owner and Owner’s Representative. The Contractor shall not load or permit any part of the structure to be loaded with a weight that will endanger its safety. The Contractor shall enforce all Owner instructions and other regulations regarding signs, advertisements, fires, and smoking and shall not allow the possession or consumption of alcohol or drugs on the premises by his or any subcontractor’s workers. The Contractor shall limit his construction activities, including material storage, to areas approved by the Owner’s Representative.

GC - 33.00 CUTTING, PATCHING, AND EXCAVATING

The Contractor shall do all cutting, fitting, or patching of his work that may be required to make its several parts come together properly and fit it to receive or be received by work of the subcontractors shown upon, or reasonably implied by, the drawings and specifications for the completed structure.
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Any cost caused by defective or improperly timed work shall be borne by the party responsible therefore. The Contractor shall not endanger any work by cutting, excavating, or otherwise altering the Work and shall not cut or alter the Work of any subcontractor except with the consent of the Architect.

The Contractor will ensure that each subcontractor leaves all chases, holes, or openings straight, true, and of proper size in its own work, or cut the same in existing work as may be necessary for the proper installation of its own or another subcontractor’s work consulting with the Owner’s Representative and the Contractor regarding proper location and size of same. In case of its failure to leave or cut same in the proper place, it shall cut them afterward at its own expense. No piers or other structural members shall be cut or modified in the field without the written consent of the Architect and Owner’s Representative. Any extensive cutting of non-structural elements shall also require the Owner’s Representative’s and Architect’s approval. After such work has been installed, it shall carefully fit around, close up, repair, patch, and point up same as directed to the entire satisfaction of the Architect. Each section of this specification shall include all cutting, patching, and excavating for that trade division unless specifically stated to the contrary.

GC - 34.00 CLEANING UP

The Contractor shall at all times keep the premises free from accumulations of waste material or rubbish caused by its employees or work, and shall remove all rubbish as often as is necessary or as directed by the Owner, Architect or Owner’s Representative, or as specified elsewhere in these documents. At the completion of the Work, it shall remove all its rubbish from and about the building, and all its tools, scaffolding, and surplus materials and shall wash all glazing and window frames inside and outside throughout the building, removing all stains, paint, etc., on same. Care shall be taken not to scratch the glazing in this clean up.

All doors and wall coverings shall be left thoroughly clean and finished; all walls and ledges shall be dusted; all plumbing fixtures shall be cleaned; all hardware shall be free of all labels, paint, stains, dust, dirt, and the like; all marks, stains, fingerprints, other oil, and dirt shall be removed from painted, decorated, or natural finish work and the building will be ready for occupancy except for being further equipped by the Owner. In case of dispute, the Owner may perform such cleaning up as may be required and charge the cost to the Contractor.

GC - 35.00 STATUTES, ORDINANCES, AND REGULATIONS

The Contract shall be governed by the laws of the State of Iowa.

The Contractor and all subcontractors shall comply with all applicable federal and state statutes, rules, regulations, and directives of any governmental body having jurisdiction over the Work to be performed. Should any of the provisions of the Contract Documents be in conflict therewith, then that portion which is in conflict shall be considered stricken and the applicable statute, ordinance, regulation, or ruling substituted therefore. All such cases of apparent conflict coming to the attention of any party shall immediately be called to the attention of the Owner. The Contractor shall strictly observe and comply with all federal and state laws pertaining to the employment and payment of labor.
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GC - 36.00 APPROVAL OF SUBSTITUTIONS

The Contractor will be held to have used in his base proposal and to furnish under the Contract those items of equipment and/or materials which are specifically identified in the specifications by a manufacturer’s name, model, or catalog number. Owner, in its sole discretion, may approve substitution of equipment and/or materials of makes other than those specifically named in the Contract Documents so long as the equipment or material proposed for substitution in the opinion of the Owner is just as suitable as equipment and/or materials named in the specifications so far as performance, construction, efficiency, and utility are concerned.

All requests for substitutions must be submitted in writing at least seven (7) working days prior to the bid opening to the Owner for evaluation and final approval. Contractor’s request shall include a complete listing of the substitutions proposed, with drawings and other data required by Owner, supporting Contract price changes pertaining to each proposed substitution. Contractor shall also furnish drawings or other data required to indicate any modifications which would result from use of the proposed changes and shall furnish general arrangement drawings, full descriptive data, and any other information required to demonstrate that the proposed substitutions are equal to the product(s) specified. The Owner will determine if the proposed substitutions are acceptable or unacceptable and will notify all potential bidders of its decisions no later than five (5) calendar days before bid opening. In the absence of the Owner’s written acceptance, no substitution will be allowed for any items specified in the Contract Documents. Acceptance by the Owner of proposed substitutions shall not relieve Contractor of the responsibility for providing workmanship, materials and equipment meeting quality standards established for the Project. No substitution may be made subsequent to the award of the Contract, except upon Owner’s written approval.

Contractor may offer alternate systems to the ones named in the specifications by submitting with the proposal and on the form provided, identifying data on the system proposed, together with a statement of the amount of addition or deduction from the base bid if the bidder’s alternate is accepted. Prior approval by the Owner is not required on items submitted as alternate bids.

GC - 37.00 OCCUPANCY

The Contractor, upon the Owner’s written request, shall allow the Owner to occupy portions of the Work and to place and install, subject to reasonable restrictions, as much equipment and furnishings during the progress of the Work as is possible without interfering with the progress of the Work. Such occupancy and the placing or installing of equipment and furnishings shall not in any way evidence the completion of the Work or signify the Owner’s acceptance of the Work, or any part of it. Equipment includes such things as kitchen equipment, etc. Furnishings include such things as lockers, benches, desks, etc. Prior to occupancy, the Architect and Owner shall make a thorough inspection accompanied by the Contractor’s superintendent to note any defects in workmanship or materials which are the responsibility of the Contractor. The provisions of the Article shall not be in limitation of the Owner’s rights set forth in Article 18.00.
The Contractor shall take adequate precautions to protect existing utilities on and off the site and avoid damage thereto. The Contractor shall repair or replace or have repaired or replaced at his own expense any damage to streets, water, sewer, light, power, cable, or telephone lines, damaged by reason of his work.

The location and extent of underground utilities and cables and conduit as indicated on the drawings are not guaranteed. This information is shown only for such use as bidders and Contractors may choose to make of it. All Contractors shall check with all public utilities companies for locations and shall comply with their regulations regarding their utilities in performing the Work.

Active underground utilities shall be adequately protected from damage and if damaged shall be immediately repaired. Removal or relocation of same shall be done only as indicated on the drawings. If they are in use, they shall be maintained in continuous service. If not indicated on the drawings or not known to exist, the Contractor shall report discovery of such lines to the Architect and shall not proceed further until directed to do so.

Inactive or abandoned utilities, whether or not they are indicated on the drawings, shall be recorded as to location and depth and shall be removed for a distance of not less that three (3) feet from outside line of all concrete work unless otherwise required by regulations. Ends shall be capped or plugged. There will be no adjustment of Contract amount for work due to inactive or abandoned utilities indicated on the drawings.

If required by the specifications, the Contractor shall provide a Project sign in such form and size as may be approved by the Owner. No other advertising is permitted on the Project site.

No explosives of any nature except for those normally employed in powder actuated tools, .38 caliber or smaller, shall be employed or used on any site except with the express and specific prior written approval of the Architect and the Owner and any appropriate governmental authorities, in each instance. The Contractor shall notify the Architect of need for such approval three (3) days prior to the proposed use of such explosives.

In addition to warranties, guarantees, operating instructions, etc., elsewhere specified, the Contractor, at the conclusion of the Work and before final payment is made, shall furnish a listing, giving principal’s names, addresses, and telephone numbers of all subcontractors and material suppliers who furnished labor or materials on the job with identification of the services rendered. There shall be provided one (1) copy to the Owner’s Representative, one (1) copy to the Architect and three (3) copies to the Owner. All copies will be delivered to the Owner’s Representative for review and distribution.
GC - 42.00 TESTING OF BUILDING SYSTEMS (COMMISSIONING)

The Contractor shall submit a written plan prior to completion and acceptance, consistent with the Contract Documents and applicable codes, for the testing of all building systems. All testing shall be of the complete system, before covering, or of individually separable larger portions of the system and shall be performed in the presence of the appropriate consultant and representative of the Owner. A written report shall be filed in the office of Facility Management, Des Moines Independent Community School District, recording each test, and signed by such consultant.

GC - 43.00 TEMPORARY OR TRIAL USAGE

Temporary or trial usage by the Owner of any mechanical device, machinery, apparatus, equipment, or any work or material supplied under the Contract before final completion and written acceptance by the Architect shall not be construed as evidence of the Architect's or Owner's acceptance of same or the commencement of any warranty periods.

The Owner has the privilege of such temporary or trial usage, for such reasonable time as the Owner and the Architect deem proper. The Contractor shall make no claim for damage or injury to or breaking of any parts of such work which may be caused by weakness or inaccuracy of structural parts or by defective materials or workmanship.

If the Contractor so elects, it may, without cost to the Owner, make such trial usage. However, trials shall only be conducted with the Architect's prior approval and under the Architect’s observation.

When heating, air conditioning, ventilating, exhaust, or other items of electrical or other equipment are installed, it shall be the responsibility of the Contractor installing such equipment to operate it for a satisfactory period of time as required by the Architect for proper testing of the equipment and instructing the Owner’s operating personnel. All items of equipment, testing meters, testing instruments, and incidentals required for proper testing and for instructing the Owner’s operating personnel, shall be provided by the Contractor responsible for providing and installing the equipment.

GC - 44.00 ASSIGNMENT

Neither party to the Contract shall assign the Contract or sublet it as a whole without the written consent of the other, nor shall the Contractor assign any moneys due or to become due to him hereunder, without the previous written consent of the Owner.

GC - 45.00 SEPARATE CONTRACTS

The Owner reserves the right to let other contracts in connection with this Work. The Contractor shall afford such other Contractors’ reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate its work with theirs.

If any part of the Contractor’s work depends for proper execution or results upon the Work of any other Contractor, the Contractor shall inspect and promptly report to the Owner through the Owner’s Representative any defects in such work that render it unsuitable for such proper execution and results. Its failure to inspect and report shall constitute an acceptance of the other Contractor’s work as fit and proper for the reception of his work, except as to defects which may develop in the other Contractor's work after the execution of its work.
To ensure the proper execution of his subsequent work, the Contractor shall measure work already in place and shall at once report to the Owner through the Architect any discrepancy between the executed work and the drawings.

**GC - 46.00 CONTRACTORS’ MUTUAL RESPONSIBILITY**

The entire Project may be covered by more than one contract and in such case there will of necessity be a certain overlapping of contracts. Each Contractor shall, therefore, take due notice of the Work called for in contracts other than his own. Should the Contractor cause damage to any separate Contractor on the Work, the Contractor agrees, upon due notice, to settle with such other separate Contractor by agreement, if it will so settle. If such other separate Contractor sues the Owner on account of any damage alleged to have been so sustained, the Owner may notify the Contractor, who shall, at the Owner’s option, defend such proceedings at the Contractor’s expense or reimburse the Owner for the expenses incurred in defense, and, if any judgment against the Owner arises therefrom, the Contractor shall pay or satisfy it and pay all costs and expenses thereby incurred by the Owner.

**GC - 47.00 LIENS**

It is hereby mutually understood by and between the parties hereto that no Contractor, subcontractor, materialman, vendee, laborer, mechanic, or other person, can or will contract for or in any other manner have or acquire any lien upon the building or works covered by this Contract, or the land upon which the same is situated.

**GC - 48.00 WORK IN EXISTING BUILDING**

In addition to all other requirements of the Contract Documents, if the Work involves an addition to an existing building, the Contractor shall erect and maintain during the progress of the Work, suitable dust-proof partitions to protect such building and the occupants thereof. If necessary in the Owner’s, Owner’s Representative’s or Contractor’s judgment, or pursuant to manufacturer’s directives or recommendations in order to protect occupants from noxious fumes, odors, or hazardous substances, the Contractor may be required to provide additional ventilation and/or work different or extended hours to avoid disruption to other activities within the existing building.

If any portions of an existing building are to be remodeled or repaired, such portions shall be adequately partitioned off with dust-proof partitions and well ventilated. Contractor’s personnel shall not access areas still in use by the Owner without prior, written authorization. All remodeling work shall be scheduled and submitted to the Owner and Owner’s Representative for approval. The various Contractors shall schedule their work jointly, in order that each may accomplish his work within such existing building in an orderly fashion during regular school vacation periods, where possible, or in such a manner as to permit full use of the building and without impairment of any existing facilities.

During the course of construction the Contractor shall maintain free and unimpeded all required exits from the building. Barricades shall be so erected that traffic is separated and protected from the construction. Such exits shall not be closed at any time for any reason while the building is occupied nor at any time when the building is unoccupied except after written approval is given by the Owner and proper warning and directional signs are posted.
The Contractor shall indemnify and hold the Owner and the Architect and their agents and employees harmless from and against all claims, damages, losses, and expenses, including attorneys’ fees arising out of or resulting from the performance of the Work, provided that any such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property, including the Work itself and including the loss of use resulting therefrom but only to the extent caused by any negligent or intentional act or omission or breach of contract of the Contractor, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder. This specific indemnification by the Contractor is in addition to and not in lieu of other remedies which may be available to the Owner.

Contractor agrees to indemnify and hold harmless the District and their agents and employees from and against all claims, damages, losses and expenses, including attorneys’ fees, arising out of or resulting from a breach of cybersecurity or other cyber fraud incident affecting Contractor that results in the disclosure of the District’s financial or other confidential information to any unauthorized person or misuse of the District’s financial or other confidential information by any unauthorized person. This specific indemnification by Contractor is in addition to and not in lieu of other remedies which may be available to the District.

The obligations of the Contractor under this Article shall not extend to and will be reduced by the liability of the Architect or the Architect’s Consultants to the extent directly attributable to and proximately caused by (A) the negligent preparation or approval of drawings or specifications, or (B) errors or omissions in written directions or instructions given by the Architect or the Architect’s Consultants.

It is understood and agreed that completion of the entire Project within the time stated in the Contract Agreement is a matter of vital necessity to the Owner, that the Owner will suffer substantial damages if the entire Project is not completed within that time, and that it would not be possible to accurately determine the amount of such damages. In view of these facts, if imposed by the Owner, the Contractor agrees to pay the Owner liquidated damages in the sum set forth in the Construction Agreement for each calendar day, if any, which elapses between the dates stated in the Construction Agreement for either or both Substantial Completion and Final Completion, as extended by any extensions of time under the provisions of the General Conditions of the Contract. If the Contractor shall fail to pay such liquidated damages, if imposed, promptly upon demand therefore, the surety on his performance bond shall pay such damages. Also, the Owner may withhold all or any part of such liquidated damages from any payments due the Contractor. No changes in the Work shall extend the time for completion unless set forth on a properly approved field order/change order. Document titled “Schedules and Liquidated Damages” shall determine if and at what amount liquidated damages will be imposed on the Project.

When the Contractor considers that the Work, or a designated portion thereof which is acceptable to the Owner, is substantially complete, the Contractor shall prepare for the Owner a list of items to be completed or corrected and submit it to the Owner’s Representative. The list shall include written warranties and related documents required by the Contract and assembled by the Contractor. The
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failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. When the Architect and the Owner’s Representative, on the basis of an inspection, jointly determine that the Work or designated portion thereof is substantially complete, the Architect and Owner’s Representative will then prepare a Statement of Responsibilities of the Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and fix the time within which the Contractor shall complete the items listed therein. Warranties required by the Contract Documents shall commence on the date of occupancy of the Work or designated portion thereof by the Owner unless otherwise provided in the Statement of Responsibilities. The Statement of Responsibilities shall be submitted to the Owner and the Contractor for his written acceptance of the responsibilities assigned in such Statement.

GC—52  REQUEST FOR EARLY RELEASE OF RETAINED FUNDS

Upon achieving Substantial Completion, the Contractor may formally request the release of all or part of the retained funds being held on the Project. The Contractor’s request for Release of Retained Funds shall be accompanied by the required sworn statement that ten (10) calendar days prior to filing the Request for Release of Retained Funds the required sworn statement was given to all known subcontractors, sub-subcontractors and suppliers that the Contractor is requesting the early release of retained funds. If proper documentation is received from the Contractor, the Owner will release the requested funds at the next monthly Board meeting of within thirty (30) days, whichever is less, except it may retain the following:

a) An amount equal to 200% of the value of labor and materials yet to be provided on the Project, which will include the value of the itemized costs for closeout phase items of the Project as listed in Section 01705 of the documents and other items as determined by the Owner and its authorized Contract representative.

b) An amount equal to 200% of the value of any Chapter 573 claims currently on file at the time the Request for Release of Retainage Funds is approved.

If the Owner withholds an amount from the retainage payment to the Contractor, the Owner will provide a reason the request is being denied the Contractor within thirty (30) calendar days of the receipt of the request.

Approval of early release of retained funds will be made by Resolution of Owner’s Board of Directors. The Request will be presented to the Board of Directors for acceptance when:

1) All Work, under the request has been certified as finally and satisfactorily completed;

2) All Work, under the request has been inspected and approved by the Owner’s representative;

3) the Contractor has certified to the Owner that the materials, labor, and services involved in each Application for Payment have been paid in accordance with the Contract Documents; and
4) Documents as outlined in Section 01705 “Early Release of Retained Funds” including, but not limited to, the following documents have been completed and received by the Owner:

- Request for Release of Retained Funds  - DMDSFM - -----
- Notice of Contractor’s Request for Early Release of Retained Funds
- Consent of Surety to Early Release of Retained Funds

**GC - 53.00 ACCEPTANCE AND FINAL PAYMENT**

Within a reasonable time after final completion of the Work and before Final Acceptance thereof, a final inspection shall be made by the Architect to determine whether the Work has been completed in accordance with the Contract Documents. A written Report of Inspection and detailed “punch list,” certified as to contents and date of inspection, shall be completed by the Architect and delivered or mailed to the Contractor.

All prior Requests for Payment shall be subject to correction in the final Request for Payment.

The balance remaining due the Contractor, if any, following Final Acceptance will be paid not earlier than thirty-one (31) days from the date of Final Acceptance of said work by the Owner, subject to the conditions and in accordance with the provision of Chapter 573 of the Code of Iowa.

Final Acceptance of the Work will be made by Resolution of Owner’s Board of Directors. The Work will be presented to the Board of Directors for Final Acceptance when:

1) All Work, including the punch list, has been certified as finally and satisfactorily completed;

2) All Work, including the punch list, has been inspected and approved by the Owner’s representative;

3) the Contractor has certified to the Owner that the materials, labor, and services involved in each Application for Payment have been paid in Accordance with the Contract Documents; and

4) Documents as outlined in Section 01700 “Contract Closeout”, including, but not limited to, the following documents have been received by the Owners:

- Application for and Certification of Payment - DMPSFM-600
- Itemization Sheet for Final Payment - DMPSFM-610
- Certificate of Completion - DMPSFM-620
- Contractor’s Affidavit of Payment of Debts & Claims - DMPSFM-630
- Contractor’s Affidavit of Release of Liens - DMPSFM-640
- Consent of Surety Company to Final Payment - DMPSFM-650
- Architect’s Certificate of Specifications - DMPSFM-660
- Lien Waivers
Required Guarantees

If any unpaid claim for such labor, materials, supplies, or equipment is filed with the Owner before payment in full of all sums due the Contractor, the Owner shall withhold from the final payment sufficient funds, if available and in accordance with Iowa Code Chapter 573, as amended, to provide for the payment of such claim, until the same shall have been paid or withdrawn. Such payment or withdrawal shall be evidenced by filing with the Owner a receipt in full or an order authorizing withdrawal signed by the claimant or his duly authorized agent or assignee.

If a claim under Iowa Chapter 573 is filed against the Owner, the Contractor agrees to defend, indemnify, hold harmless and/or reimburse the Owner from, against and for any and all damages, settlements, payments or expenses, (including reasonable attorneys' fees) incurred by the Owner on account of any and all claims filed against the Project as a direct result of the Contractor.

If any claim for such labor, materials, supplies, or equipment remains unsatisfied after all payments are made by the Owner to the Contractor, the Contractor shall refund to the Owner all sums which the latter may for any reason be compelled to pay to satisfy such claim, including all costs and attorneys' fees incurred by the Owner as a result of the Contractor's default in such respect.

The making and acceptance of the final payment shall not constitute a waiver of any claims by the Owner, including, among other things, those arising from unpaid claims, from faulty work which appears before or after final payment, or from any failure to comply with any requirements of the Contract Documents.

GC – 54.00 Warranties on Portions of the Work

The Contractor shall, in case of work performed or materials or equipment provided for which warranties are required by the Contract Documents, secure the required warranties and deliver copies thereof to the Architect and the Owner upon completion of the Work. All such warranties shall commence from the date set forth in the Certificate of Substantial Completion and will not in any way reduce the Contractor's responsibilities under his Contract. Whenever guarantees or warranties are required by the specifications for a longer period than one year, such longer period shall govern.

Contractor shall provide Owner with an acceptable maintenance bond at the time of Final Acceptance. Maintenance guarantee shall run for one (1) year from the time of acceptance to protect Owner from faulty workmanship and materials as outlined in the preceding paragraph.

GC - 55.00 Contractor's Project Guarantee After Completion

The Contractor expressly warrants and guarantees that the Project will be constructed in a good, firm, substantial workmanlike manner; free from structural and workmanship defects and defects in materials; and that the improvements will be fit for occupancy and built in strict compliance with contract documents.

Neither the Architect's approval of the final Request for Payment nor payment of any Request for Payment or of any sum previously withheld from the Contractor shall relieve the Contractor of responsibility for its warranty and guarantee hereunder or for faulty materials or workmanship, and, unless otherwise agreed, it unconditionally agrees to remedy any defects due thereto, and pay for any damages resulting therefrom, which shall appear within a period of one (1) year from the date set forth
in the Letter of Acceptance of his work. The Contractor shall repair or replace any defective
workmanship and materials in a manner acceptable to the Owner, without expense to the Owner, within
ten (10) days after written notification by the Owner of such defect. If said repairs or replacements or
mutually satisfactory arrangements have not been made within ten (10) days, the Owner shall make said
repairs or replacements and charge the cost to the Contractor.

The Owner, the Architect, and the Contractor together shall make at least one (1) complete inspection of
the Work after the Work has been accepted by the Architect and the Owner. Such inspection shall be
made approximately eleven (11) months after the acceptance of the Work. The Architect shall make a
written report of the inspection, certified as to contents and date of inspection, and forward the report
by mail to the Owner and the Contractor within seven (7) days after completion of the inspections. The
Contractor shall immediately initiate such remedial work as may be necessary to correct any deficiencies
or defective work shown by this report and shall promptly complete all such remedial work in a
satisfactory manner.

If the Contractor fails to promptly correct deficiencies and defects shown by the report within ten (10)
days after notice thereof, the Owner may do so. The Owner shall be entitled to collect from the
Contractor all costs and expenses incurred in correcting such deficiencies and defects, as well as all
damages resulting from such deficiencies and defects. The guarantee and warranties of the Contractor
provided for herein are in addition to and not in lieu of any other remedies available to the Owner.

The Owner has arranged for a separate consultant to conduct field and laboratory soil investigations on
the site and to prepare a report of the findings. Such reports, as appropriate, are included as an
attachment to the specification. Such data is offered solely for reference and is not to be considered a
part of the Contract Documents. The data contained in any such document prepared for the Owner by a
separate consultant is believed to be reliable; however, the Owner and Architect do not guarantee its
accuracy or completeness. All applicable subcontractors shall be fully familiar with the contents of such
reports, if prepared, and shall consider and evaluate them in the performance of their contracts.

The Contractor shall exercise due diligence in seeing that all equipment, materials, and supplies are
ordered and delivered well in advance of the time they are needed on the job; and it shall properly store
and protect same at his expense and in accordance with these General Conditions, either at the site or
elsewhere as approved by the Architect. It shall, when requested, submit to the Architect evidence that
such orders have been placed and/or received.

Except as otherwise specifically required by the Technical Specifications at the completion of the Project,
all loose keys for hose bibs, adjustment keys and wrenches for door closers and panic hardware, keys for
electric switches, electrical panels, and all other equipment shall be identified and accounted for and
turned over to the Architect for transmittal to the Owner.

If required by the Contract Documents, the Contractor shall use the Internet based Project Management
system for communications and tracking of the Project. The system shall be used to keep comprehensive
account of Project activities, conditions and issues including, but not necessarily limited to, general correspondence, reports, drawings, drawing submittals and drawing schedules, submittals, shop drawings, payment requests, transmittals, change request, and authorization, meeting minutes, confirmation of oral instruction, notice of non-conforming work, press photographs, call-back requests, and other documentation as may be specified by the Owner. The Contractor shall have access to the program established at their main office as well as the Project site. There is no fee associated with the use of the Internet based Project Management System.
The following supplements modify, change, delete from or add to the General Conditions of the Contract for Construction. Where any Article of the General Conditions is modified or any Paragraph, Subparagraph, or Clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph, or Clause shall remain in effect.

END OF DOCUMENT
1.1 SUMMARY

A. Section Includes:
1. Project description.
2. Work by Owner.
3. District Furnished Products.
4. Contractor’s Use of Site and Premises.
5. Surrounding Site Condition Survey.
6. Work Sequence.
7. District Occupancy.

1.2 PROJECT DESCRIPTION

A. Location: The site is located at the address indicated on the title page.
B. The project includes an exterior masonry restoration, exterior wood and metal fenestration restoration, roofing repairs, balcony repair, and site improvements as reflected in the construction documents.
C. The Owner has contracted or will contract with multiple contractors for renovation of the facilities. The work of additional prime contractors is anticipated to be as follows:
   - Abatement

1.3 WORK BY OWNER

A. Items noted "NIC" (Not in Contract), will be furnished and installed by others separately from the work included in these Bid Packages.

1.4 DISTRICT FURNISHED PRODUCTS

A. Products furnished by the District and installed by the Contractor. Refer to drawings for these items.
B. District's Responsibilities:
   1. Arrange and pay for owner furnished product delivery to site. (Verify for each item)
   2. On delivery, inspect products jointly with Contractor.
   3. Submit claims for transportation damage and replace damaged, defective, or deficient items.
   4. Maintain manufacturer's warranties, inspections and service.
   5. Obtain receipt for materials delivered to Contractor.
C. Contractor's Responsibilities:
   1. Receive and unload products at site; inspect for completeness or damage, jointly with District.
   2. Handle, store, install and finish products.
3. Repair or replace items damaged after receipt.

### 1.5 CONTRACTOR USE OF SITE AND PREMISES

A. Limit use of site and premises to allow:
   1. District use of the existing building during the construction period.
   2. Work by other contractors and work by District.
   3. Safe use of site and premises by public.
   4. Contractor and subcontractor employees’ use of areas outside construction zone is restricted.

B. Coordinate use of premises under direction of the Owner.

C. Notify Owner in advance of a shutdown of utilities or work outside designated construction and staging areas. Coordinate such work with Owner. All utility shutdowns shall be approved by the Owner.

### 1.6 SURROUNDING SITE CONDITION SURVEY

A. Prior to commencement of work, the Contractor, the Owner and the Architect shall jointly survey the site and existing buildings, paving, plant life, and other items, noting and recording existing damage such as cracks, sags, loose blocks or bricks, unhealthy plant life, and other damage.

B. This record shall serve as a basis for determination of subsequent damage to these items due to settlement or movement due to demolition and construction operations.

C. Such damage, as noted, shall be suitably marked on the item, if possible, and the official record of existing damage shall be signed by the parties making the survey.

D. Cracks, sags, or other damage to the site and adjacent buildings, paving, plant life, and other items not noted in the original survey, but subsequently observed shall be reported immediately to the Owner in writing.

### 1.7 WORK SEQUENCE

A. Construct work in phases to accommodate District requirements during the construction period. Coordinate construction schedule and operations with the Owner. Sequencing is listed in Section 00210.

### 1.8 DISTRICT OCCUPANCY

A. The District will occupy the existing building during the construction period.

B. Time is of the essence.

**PART 2 - PRODUCTS**

Not used

**PART 3 - EXECUTION**

Not used

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Procedures for preparation and submittal of Applications for Payment.

B. Related Sections:

3. Section 01300 - Submittals: Submittal procedures.
4. Section 01700 - Contract Closeout: Final Payment.
5. Document 00800 - Supplementary Conditions

1.2 SCHEDULE OF VALUES

A. Submit to the Owner’s Representative a Schedule of Values allocated to the various portions of the Work broken down by building and trade, supported by data to substantiate its accuracy as the Owner’s Representative, Architect, and the Owner may require. This schedule, when approved, shall be used as a basis for the Contractor's application for payment.

B. Sample of the Schedule of Values format follows this section. All line items shall be separated into labor and material components. A separate line item shall be included in the Schedule of Values for the Contractors Overhead and Profit.

C. Schedule of Values must be submitted, reviewed and approved by the Owner’s Representative and Architect prior to the first Application for Payment.

1.3 FORMAT

A. Sample of the Application for Payment form follows this Section and is titled "Application and Certification for Payment". Electronic emailed copies of payment applications will be used.

1.4 PREPARATION OF APPLICATIONS

A. Applications shall be prepared in two copies.

B. Contractor to meet with Owner’s Representative and Architect at regular job progress meeting to review proposed Application for Payment.

C. Application as tentatively approved by Owner’s Representative and Architect shall be submitted.

D. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed.

E. Submit back-up documentation to support Application for Payment as may be requested by the Architect or Owner’s Representative.

F. Architect will review Project Record Documents at each billing meeting. Status of Project Record Documents will be considered in evaluating proposed monthly billings.

G. List each authorized Change Order as an extension on the Schedule of Values, listing Change
Order number and dollar amount as for an original item of Work.

H. Prepare Application for Final Payment as specified in Section 01700.

I. Prepare and submit with each Application for Payment the List of Potential Claims that follows this section per the requirements of paragraph G.C. – 18.01 of the General Conditions, Section 00700.

J. Prepare requests and accompanying sworn statement for early release of retained funds upon Substantial Completion as specified in Section 01705 “Early Release of Retained Funds”

1.5 SUBMITTAL PROCEDURES

A. All submittals associated with the Application for Payment shall be done in one copy.

B. Submit an updated construction schedule with each Application for Payment.

C. Payment Period: Submit at monthly intervals as coordinated by the Owner’s Representative.

D. Submit substantiating data as may be required.

E. Submit waivers on the form approved by the Owner’s Representative.

F. Submit list of potential claims.

1.6 SUBSTANTIATING DATA

A. When Owner’s Representative requires substantiating information, submit data justifying dollar amounts in question.

B. Provide one copy of data with cover letter for each copy of submittal. Show Application number, date, and line item by number and description.

C. When Application for Payment is requesting payment for stored materials the following information shall be submitted:

1. Letter transferring ownership of material stored off site.

2. Insurance certificate covering material stored off site.

3. Invoice from supplier confirming cost of all stored material, whether on or off site.

1.7 PAYMENT PERIOD

A. If the Contractor has made a request for payment as stated above, the District will, with reasonable promptness, issue payments to the Contractor on the next standard monthly payment schedule, for such amount as the District, Architect, and Owner’s Representative determine to be properly due. If there are no problems with that month’s progress billing, reimbursement for compensation shall be paid to the Contractor no later than thirty (30) days from the approved progress billing.

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

Not used

END OF DOCUMENT
LIST OF POTENTIAL CLAIMS

To: Des Moines Public Schools
From:

SMOUSE OPPORTUNITY SCHOOL EXTERIOR IMPROVEMENTS: Invoice Period:
Bid Number: From: To:

Check one of the following:

Yes, we have the following listed potential claims for the contract period listed above. (List below or on additional sheets the potential claims for this contract period. Include description of potential claim and a potential estimated cost.)

No, we do not have any potential claims for the contract period listed above.

(Signature) (Date)
(Printed Name) (Title)
APPLICATION AND CERTIFICATE FOR PAYMENT

AIA DOCUMENT G702

Des Moines Public Schools: PROJECT: APPLICATION NO.: Distribution to:
1917 Dean Avenue PROJECT NO.: PERIOD TO: DMPS & Architect
Des Moines, IA 50316

FROM CONTRACTOR: VIA ARCHITECT: CONTRACT DATE:

CONTRACTOR’S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract. Continuation Sheet, AIA Document G703, is attached.

1. ORIGINAL CONTRACT SUM

2. Net change by Change Orders

3. CONTRACT SUM TO DATE (Line 1 + 2)

4. TOTAL COMPLETED & STORED TO DATE
   (Column G on G703)

5. RETAINAGE:
   a. 10% of Completed Work
   (Columns D + E on G703)
   b. 1% of Stored Material
   (Column F on G703)
   Total Retainage (Line 5a + 5b or Total in Column I of G703)

6. TOTAL EARNED LESS RETAINAGE
   (Line 4 less Line 5 Total)

7. LESS PREVIOUS CERTIFICATES FOR PAY
   (Line 6 from prior Certificate)

8. CURRENT PAYMENT DUE

9. BALANCE TO FINISH, INCLUDING RETAINAGE
   (Line 3 less Line 6)

The undersigned Contractor certifies that to the of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By: Date: ______________

State of: County of: Iowa

Subscribed and sworn to before me this ______ day of Month, 201__

Notary Public:

My Commission expires: ______________

ARCHITECT’S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED

(Attach explanation if amount certified differs from the amount applied for. Initial all figures on this Application and on the Continuation Sheet that are changed to conform to the amount certified.)

ARCHITECT:

By: Date: ______________

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

CHANGE ORDER SUMMARY

<table>
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<th>ADDITIONS</th>
<th>DEDUCTIONS</th>
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<td>Total approved this Month</td>
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<td>TOTALS</td>
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This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

CAUTION: You should use an original AIA document which has this caution printed in red. An original assures that changes will not be obscured as may occur when documents are reproduced.
AIA Document G702, APPLICATION AND CERTIFICATE FOR PAYMENT, containing Contractor's signed Certification is attached.
In tabulations below, amounts are stated to the nearest dollar.
Use Column I on Contracts where variable retainage for line items may apply.

### AIA Document G703

**APPLICATION NUMBER:**
**APPLICATION DATE:**
**PERIOD TO:**
**ARCHITECT'S PROJECT NO:**

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<th>ITEM NO.</th>
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<th>%</th>
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**PROJECT TOTAL**

|          | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |

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AIA DOCUMENT G703 APPLICATION AND CERTIFICATE FOR PAYMENT MAY 1983 EDITION "AIA" @ 1983
THE AMERICAN INSTITUTE OF ARCHITECTS, 1735 NEW YORK AVENUE, N.W., WASHINGTON, D.C. 20006
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G703-1983
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
   1. Submittals.
   3. Change procedures.
   4. Execution of change orders.
   5. Correlation of Contractor submittals.

B. Related Sections
   2. Section 01300 - Submittals.

1.15 DEFINITIONS

The following definitions shall be used in establishing prices for change orders:

A. “Price” is the direct cost of material, labor, equipment, insurance, bond, and subcontract costs, plus profit and overhead.

B. “Cost” is the direct expense for material, labor, equipment, insurance, bond, and subcontract costs.

C. “Direct expense” is the Contractor’s actual cost of any item that is required for the completion of his Contract obligation (i.e., tool rental, material, equipment, etc.).

D. “Overhead” is a business expense created by the project, but not necessarily a direct part of that portion of the work involved (i.e., small tools, project management, (including job site superintendent, administrative support, etc.).

E. “Profit” is the compensation accruing to the Contractor for the assumption of risk in a business enterprise.

1.2 SUBMITTALS

A. Submit name of the individual authorized to receive change documents and be responsible for informing others in Contractor’s employ or Subcontractors of changes to the Work.

B. Field Order Request Forms: Forms approved by the Owner’s Representative and Owner.

C. Approved Forms are attached to this Section.

D. FIELD ORDER REQUESTS MUST BE SUBMITTED IN WRITING WITHIN TEN (10) DAYS FROM THE DATE THE CONTRACTOR HAS KNOWLEDGE OF THE PROPOSED CHANGE.

1.3 DOCUMENTATION OF CHANGE IN CONTRACT SUM AND CONTRACT TIME

A. Furnish a proposal for a Field Order Request containing a price breakdown, itemized as required by the Owner’s Representative. The breakdown shall be in sufficient detail to permit an analysis of all direct costs, such as material, labor, equipment, insurance, bond,
and subcontract costs. Any amount claimed for subcontracts shall be supported by a similar price breakdown.

B. Maintain detailed records of work done on a time and material basis. Provide a complete description of the proposed change together with complete information required for evaluation and to substantiate costs of all changes in the Work.

C. Document each quotation for a change in cost or time with sufficient data to allow evaluation of the quotation.

D. Provide additional data to support computations for each request:
   1. Quantity of products, labor and equipment.
   2. Taxes, insurance and bonds.
   3. Justification for any change in Contract Time (Applies to critical path items only)
   4. Credit for deletions from Contract, similarly documented.

E. Support each claim for additional costs, and for work done on a time and material basis, with additional information:
   1. Origin and date of claim.
   2. Dates and times work was performed, and by whom.
   3. Time records and wage rates paid.
   4. Invoices and receipts for products, equipment, and subcontracts, similarly documented.

### 1.4 PROFIT & OVERHEAD MARK-UP FOR FIELD ORDERS AND CHANGE ORDERS

A. The profit and overhead mark-up on costs for all change orders shall NOT EXCEED the following:
   1. Fifteen (15) percent maximum mark-up for overhead and profit for Work directly performed by employees of the Contractor, Subcontractor or Sub-Subcontractor.
   2. Five (5) percent maximum Contractor’s mark-up for overhead and profit for Work performed or passed through by a Subcontractor and passed through to the Owner by the Contractor.
   3. Five (5) percent maximum Subcontractor’s mark-up for overhead and profit for Work performed or passed through by a Sub-Subcontractor and passed through to the Owner by the Subcontractor and Contractor.
   4. Regardless of the above, the maximum allowable total mark-up for all tiers of contractors shall be twenty (20) percent passed through to the Owner by the Prime Contractor under any circumstances.

### 1.5 CHANGE PROCEDURES – FIELD ORDERS & CHANGE ORDERS

A. The Architect will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time by issuing supplemental instructions.

B. The Owner’s Representative may issue a Field Order Request which includes a detailed description of a proposed change with supplementary or revised Drawings and Specifications, a change in Contract Time for executing the change, and the period of
time during which the requested price will be considered valid. Contractor shall prepare and submit an estimate within 10 days.

C. The Contractor may propose a change by submitting a request for change to the Owner’s Representative describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation.

D. For any potential claims, the Contractor must fill out a Potential Claim Form with each monthly Pay Application. See paragraph 18.01 of the General Conditions and Section 01027 – Application for Payment

1.5 EXECUTION OF FIELD ORDERS

A. Upon the Owner’s approval of a Field Order Request (FOR), it will act as the authorization for the Contractor to proceed with the change.

B. Field Order Requests are executed for any change up to 15% of contract amount and are approved by the District’s Chief Operating Officer.

C. If Total of all FORs exceed 15% of the total contract value, the school board will be notified and any changes beyond this point are presented to the school board for approval.

1.6 CORRELATION OF CONTRACTOR SUBMITTALS

A. Contractor will promptly revise Schedule of Values and Application for Payment forms to record each authorized Field Order Request as a separate line item and adjust the Contract Sum.

B. Promptly revise progress schedules to reflect any changes in Contract Time, revise sub-schedules to adjust time for other items of work affected by the change, and resubmit.

C. Promptly enter changes in Project Record Documents.

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

Not used

END OF SECTION
1.1 SECTION INCLUDES
   A. Submission procedures.
   B. Documentation of changes to Contract Sum and Contract Time.

1.2 RELATED SECTIONS
   A. Document 00310 - Proposal: Schedule of Bid Alternates.
   B. Document 00510 - Agreement Form: Incorporating monetary value of accepted Alternates.
   C. Document 00100 - Instructions To Bidders: Requirements for Alternates.
   D. Section 01310 - Progress Schedules: Work schedule affected by Alternates.
   E. Section 01600 - Material and Equipment: Product options and substitutions.

1.3 REQUIREMENTS
   A. Submit Alternates with full description of the proposed Alternate and the affect on adjacent or related components.
   B. Alternates quoted on Proposal Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.
   C. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

1.4 SELECTION AND AWARD OF ALTERNATIVES
   A. Indicate variation of Bid Price for Alternates described below and list in Proposal Form or any supplement to it which requests a 'difference' in Bid Price by adding to or deducting from the base bid price.
   B. Bid may be evaluated on base bid price, Consideration may be given to Alternates and Bid Price adjustments.

1.5 SCHEDULE OF ALTERNATES
   A. Alternate 1: Provide sealant in lieu of new mortar per note 1B on sheet A2.0

PART 2 – PRODUCTS
   Not used

PART 3 – EXECUTION
   Not used

END OF SECTION
1.1 SUMMARY
A. Section Includes
   1. Coordination
   2. Pre-construction Meeting
   3. Project Meetings
   4. Pre-installation Conferences
   5. Electrical and Mechanical Coordination
   6. Coordination with Work by District
   7. Special Meetings
   8. Coordination of Contract Closeout

1.2 COORDINATION
A. Coordinate scheduling, submittals, and Work of the various Sections of specifications to assure efficient and orderly sequence of Work, with provisions for accommodating items to be installed later and for accommodating items to be installed by the District and other Contractors.
B. Resolve differences or disputes concerning coordination, interference, or extent of work of the various sections of the specifications. Contractor's decisions if consistent with the requirements of the Contract Documents shall be final.
C. Coordinate completion and clean up of Work of separate Sections in preparation for Substantial Completion.
D. Coordinate requests for substitutions to assure compatibility of space, of operating elements, and affect on work of other sections.
E. Coordinate sequence of work to accommodate District occupancy as specified in Section 01010.
F. Coordinate work so that work within telecom rooms is the first work done when a new trade comes on-site.

1.3 PRE-CONSTRUCTION MEETING
A. The Owner’s Representative will schedule a conference after Notice of Contract Award and prior to the start of Work.
B. Attendance Required: Owner, Architect, Owner’s Representative, Contractor, and others as appropriate.
C. Agenda:
   1. Submission of executed bonds and insurance certificates.
   3. Submission of Schedule of Values, and progress schedule.
4. Designation of personnel representing the parties in Contract, the Owner’s Representative, and the Architect.

5. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders and Contract Closeout procedures.

1.4 PROJECT MEETINGS

A. The Owner’s Representative will schedule and administer meetings throughout progress of the Work at weekly intervals or as designated.

B. The Owner’s Representative will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings, receive minutes from the Architect, and distribute copies within two days to Contractor, Architect, Owner, participants and those affected by decisions made. Architect will record minutes in an approved format within 2 days and deliver to Owner’s Representative. In the event Architect does not provide minutes within 48 hours, the Owner’s Representative may prepare minutes.

C. Attendance Required: Project Manager, job superintendent, major Subcontractors, suppliers and others as appropriate to agenda topics for each meeting.

D. Agenda:
   1. Review minutes of previous meetings.
   2. Review of Work progress.
   3. Field observations, problems and decisions.
   4. Identification of problems that impede planned progress.
   5. Review of submittals schedule and status of submittals.
   6. Maintenance of progress schedule.
   7. Corrective measures to regain projected schedules.
   8. Planned progress during each succeeding work period.
   9. Coordination of projected progress.
   10. Maintenance of quality standards and work standards.
   11. Effect of proposed changes on progress schedule and coordination.
   12. Other business relating to Work.

1.5 PRE-INSTALLATION CONFERENCES

A. The Contractor will convene pre-installation conferences when required by individual Section of the Specifications. Include affected parties including the owner’s representative and the Architect/Engineer.

1.6 ELECTRICAL AND MECHANICAL COORDINATION

A. Coordinate use of project space and sequence of installation of mechanical and electrical work that is indicated diagrammatically on Drawings. Follow routings shown for pipes, ducts, and conduits as closely as practicable, with due allowance for available physical space; make runs parallel with lines of building. Utilize space efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
SMOUSE OPPORTUNITY SCHOOL EXTERIOR IMPROVEMENTS

B. Use large scale drawings, if their preparation is required as part of work of Division 15 - Mechanical, and Division 16 - Electrical, of these specifications, together with shop drawings and layout drawings of other affected sections of these specifications to check, coordinate and integrate the work of various sections to prevent interferences.

C. Perform and complete checking and coordination before commencing construction in the affected areas.

D. In finished areas, except as otherwise shown, conceal pipes, ducts, and wiring in the construction. Coordinate locations of fixtures and outlets with finish elements.

1.7 COORDINATION WITH WORK BY DISTRICT

A. Coordinate service connections for District furnished and District installed equipment. Verify that service connections are correct sizes and in required locations.

B. Coordinate support and anchorage for equipment furnished and installed by the District. Provide blocking and backing as shown or directed to facilitate installation of equipment by others.

1.8 SPECIAL MEETINGS

A. The Owner’s Representative may call special meetings at any time during the course of the project. Special project meetings, if deemed necessary, shall include representatives of the Contractor and subcontractors as required by the Owner’s Representative.

1.9 COORDINATION OF CONTRACT CLOSEOUT

A. Coordinate completion and cleanup of work of separate sections in preparation for Substantial Completion.

B. After District occupancy of premises, coordinate access to site by the various construction trades for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of District’s activities.

C. Assemble and coordinate closeout submittals.

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

Not used

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES
   A. Requirements and limitations for cutting and patching of work.

1.2 RELATED SECTIONS
   A. Section 01010 - Summary of Work: Work by District or by separate contractors.
   B. Section 01120 - Alteration Project Procedures: Cutting and patching for alteration work.
   C. Section 01300 - Submittals.
   D. Section 01630 - Product Options and Substitutions.
   E. Individual Product Specification Sections:
      1. Cutting and patching incidental to work of the section.
      2. Advance notification to other sections of openings required in work of those sections.
      3. Limitations on cutting structural members.

1.3 SUBMITTALS
   A. Submit written request in advance of cutting or alteration which affects:
      1. Structural integrity of any element of project.
      2. Integrity of weather-exposed or moisture-resistant element.
      3. Efficiency, maintenance, or safety of any operational element.
      5. Work by District or by separate contractor.
   B. Include in request:
      1. Identification of project.
      2. Location and description of affected work.
      3. Necessity for cutting or alteration.
      4. Description of proposed work, and products to be used.
      5. Alternatives to cutting and patching.
      6. Effect on work of District or separate contractor.
      7. Written permission of affected separate contractor.
      8. Date and time work will be executed.

1.4 QUALITY ASSURANCE
   A. Patching shall achieve security, strength, weather protection and continuity of fire ratings, as applicable.
   B. Patching shall successfully duplicate undisturbed adjacent finishes, colors, textures, and profiles. Where there is a dispute as to whether duplication is successful or has been achieved to a reasonable degree, the Architect's judgment shall be final.
PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Inspect existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching.

B. After uncovering existing work, inspect conditions affecting performance of work.

C. Beginning of cutting or patching means acceptance of existing conditions.

3.2 PREPARATION

A. Provide temporary supports to ensure structural integrity of the work. Provide devices and methods to protect other portions of project from damage.

B. Provide protection from elements for areas which may be exposed by uncovering work.

C. Maintain excavations free of water.

3.3 CUTTING AND PATCHING

A. Execute cutting, fitting, and patching including excavation and fill to complete work.

B. Fit products together, to integrate with other work.

C. Uncover work to install ill-timed work.

D. Remove and replace defective or non-conforming work.

E. Remove samples of installed work for testing when requested.

F. Provide openings in the work for penetration of mechanical, electrical and other work.

3.4 PERFORMANCE

A. Execute work by methods to avoid damage to other work, and which will provide appropriate surfaces to receive patching and finishing.

B. Employ original installer to perform cutting and patching for weather exposed and moisture resistant elements and sight-exposed surfaces installed as work of this Contract.

C. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

D. Restore work with new products in accordance with requirements of Contract Documents.

E. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

F. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material to full thickness of the penetrated element.

G. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit. Painted surfaces shall not present a spotty, touched-up appearance.

END OF SECTION
1.1 SECTION INCLUDES
   A. Quality control.
   B. Surveying services.
   C. Project record documents.

1.2 RELATED SECTIONS
   A. General Conditions: Benchmarks, Monuments, Statues and Measurements. GC-13
   B. Section 01700 - Contract Closeout: Project record documents.

1.3 QUALITY CONTROL
   A. Employ a professional Engineer of the discipline required for specific service on project, licensed in the State of Iowa.
   B. Submit evidence of Engineer’s errors and omissions insurance coverage in the form of an Insurance Certificate.

1.4 SUBMITTALS
   A. Submit name, address, and telephone number of Engineer before starting survey work.
   B. On request, submit documentation verifying accuracy of survey work.
   C. Submit a copy of registered site drawing and certificate signed by the Engineer, that the elevations and locations of the work are in conformance with Contract Documents.

1.5 PROJECT RECORD DOCUMENTS
   A. Maintain complete, accurate log of control and survey work as it progresses. Indicate dimensions, locations, angles, and elevations of construction and site work.
   B. Submit Record Documents under provisions of Section 01700.
   C. Project Record documents are to be updated on a regular basis. The status of the Project Record Documents will be considered when evaluating Applications for Payment. See section 1027 paragraph 1.4 E.

1.6 EXAMINATION
   A. Verify locations of survey control points prior to starting work.
   B. Promptly notify Architect of any discrepancies discovered.

1.7 SURVEY REFERENCE POINTS
   A. Contractor to locate and protect survey control and reference points.
   B. Control datum for survey is that indicated on Drawings.
   C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
   D. Promptly report to Program Manager the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
   E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
1.8 SURVEY REQUIREMENTS

A. Provide field engineering services. Utilize recognized engineering survey practices.

B. Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on Project Record Documents.

C. Establish lines and levels, locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
   2. Grid or axis for structures.
   3. Building foundation, column locations, and ground floor elevations.

D. Periodically verify layouts by same means.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION
1.1 SUMMARY
A. Section Includes
   1. Quality Assurance.
   2. Statutory and Jurisdictional Regulations.
B. Related Sections
   1. Document 00700 - General Conditions of the Contract for Construction

1.2 QUALITY ASSURANCE
A. For products of 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.

1.3 STATUTORY AND JURISDICTIONAL REGULATIONS
A. All work shall conform to the following requirements:
   All building projects for Des Moines Public Schools (DMPS) shall be designed and Contract Documents prepared in conformity with the following Codes and Regulations:
   1. International Building Code (Most current version used by City of Des Moines)
   2. International Existing Buildings Code (Most current version used by City of Des Moines)
   3. Des Moines Municipal Code
   4. Uniform Plumbing Code (Most current version used by City of Des Moines)
   5. National Electric Code (Most current version used by City of Des Moines)
   6. International Mechanical Code (Most current version used by City of Des Moines)
   7. International Fire Code (Most current version used by City of Des Moines)
   8. Metropolitan Design Standards for Engineering
   10. ADA Accessibility Guideline for Buildings and Facilities
   15. United States Occupational Safety and Health Administration 29CFR 1910 –

1.4 GENERAL STANDARDS FOR WORK AND MATERIALS

A. Trade Standards:

1. Referenced standards shall have full force and effect as though printed herein. Upon request, Architect will furnish information as to where copies may be obtained.

2. Material or trade associations, societies, or other bodies regularly publishing standards most widely used under these documents are listed herein together with reference symbols.

3. Individual standards referenced in technical specifications (Divisions 1 through Division 16) shall also apply to the work of this contract.

4. No construction shall commence until building plans have been submitted to and approved by the State Fire marshal’s Office and the State Building Code Bureau and/or other approving agencies as applicable.

1.5 APPLICATION

A. If there is a conflict between any referenced standard and the Contract Documents, notify the Program Manager, and await instructions before proceeding with affected work.

B. The contractual relationships, duties, and responsibilities of the parties to the Contract shall not be altered by mention or inference in any reference document.

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

Not used

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Products and installation for patching and extending existing work.
B. Products and installation for installing new components in existing construction.
C. Transition and adjustments.
D. Repair of damaged surfaces, finishes, and cleaning.

1.2 RELATED SECTIONS
A. Section 01040 - Coordination: Work sequence: District occupancy.
B. Section 01045 - Cutting and Patching.
C. Section 01500 - Construction Facilities and Temporary Controls: Temporary enclosures, protection of installed work and existing facilities, and cleaning during construction.

PART 2 - PRODUCTS

2.1 PRODUCTS FOR PATCHING AND EXTENDING WORK
A. New Materials: As specified in product sections or match existing products and work for patching and extending work.
B. Type and Quality of Existing Products: Determine by inspection and testing products where necessary, referring to existing work as a standard.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Verify that demolition is complete, and areas are ready for installation of new work.
B. Beginning of restoration work means acceptance of existing conditions.

3.2 PREPARATION
A. Cut, move, or remove items as necessary for access to alterations and renovation work. Replace and restore at completion.
B. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished work.
C. Remove items to be salvaged and relocate to an area on the main level of the building as designated by the Owner’s Representative. Coordinate Owner’s storage with Owner’s Representative. Weather protect until acceptance by Owner.
D. Remove debris and abandoned items from area and from concealed spaces.
E. Prepare surface and remove surface finishes to provide for proper installation of new work and finishes.
F. Close openings in exterior surfaces to protect existing work and salvage items from weather and extremes of temperature and humidity. Insulate ductwork and piping to prevent condensation in exposed areas.
G. Protect existing fire alarm sensors and wiring in ceilings and walls from damage.
1. Alert Owner’s Representative prior to work in buildings with existing active fire alarm sensors to avoid response to false alarm and advise Owner’s Representative each day at end of work to reinstate response to alarms.

3.3 INSTALLATION

A. Coordinate work of alterations and renovations to expedite completion sequentially and to accommodate District occupancy.
B. Remove, cut, and patch work in a manner to minimize damage and to provide a means of restoring products and finishes to specified condition.
C. Refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes.
D. Advise Architect of existing plumbing, heating, ventilation, air conditioning, and electrical systems which are found to be deficient during course of the work.
E. Install products as specified in individual sections.

3.4 TRANSITIONS

A. Where new work abuts or aligns with existing, perform a smooth and even transition. Patch work to match existing adjacent work in texture and appearance.
B. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division.

3.5 ADJUSTMENTS

A. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
B. Where a change of plane of 1/4 inch or more occurs, provide for a smooth transition.
C. Trim existing doors as necessary to clear new floor finish. Refinish trim as required.
D. Fit work at penetrations of surfaces as specified in Section 01045.

3.6 FINISHES

A. Finish surfaces as specified in individual product sections.
B. Finish patch work to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

END OF SECTION
SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. This project may require extended work hours in order to meet the completion date. See Specification Section 00210 for Phasing and Schedule Requirements.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements governing allowances.

1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

B. Types of allowances include the following:

1. Lump-sum allowances.
2. Unit-cost allowances.
3. Quantity allowances.
4. Contingency allowances.

C. Related Requirements:

1. Section 012200 "Unit Prices" for procedures for using unit prices.
2. Section 01400 "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.

1.3 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by Architect from the designated supplier.
1.4 ACTION SUBMITTALS  
A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

1.5 INFORMATIONAL SUBMITTALS  
A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.  
B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.  
C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.6 COORDINATION  
A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.7 UNIT-COST AND QUANTITY ALLOWANCES  
A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include, freight, and delivery to Project site.  
B. Unless otherwise indicated, Contractor’s costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials under allowance shall be included as part of the Contract Sum and not part of the allowance.  
C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.  
   1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner’s storage space as directed.

1.8 ADJUSTMENT OF ALLOWANCES  
A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
1. Include installation costs in purchase amount only where indicated as part of the allowance.
2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
3. Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.
4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
5. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor’s handling, labor, installation, overhead, and profit.

1. Do not include Contractor’s or subcontractor’s indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
2. No change to Contractor’s indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

A. Allowance No. 1: Quantity Allowance: (200) sq.ft. of re-pointing brick per restoration keynote 1a.

1. Coordinate quantity allowance adjustment with unit-price requirements in Section 012200 “Unit Prices.”
B. Allowance No. 2: Quantity Allowance: (75) lineal feet of stone repointing.
   1. Coordinate quantity allowance adjustment with unit-price requirements in
      Section 012200 "Unit Prices."

C. Allowance No. 3: (10) lineal feet of steel lintel restoration and paint
   1. Coordinate quantity allowance adjustment with unit-price requirements in
      Section 012200 "Unit Prices."

D. Allowance No. 4: Quantity Allowance: (25) lineal feet of sealant replacement for
   window or masonry.
   1. Coordinate quantity allowance adjustment with unit-price requirements in
      Section 012200 "Unit Prices."

E. Allowance No. 5: Quantity Allowance: (10) lineal feet of sealant installation were
   existing mortar joints are removed.
   1. Coordinate quantity allowance adjustment with unit-price requirements in
      Section 012200 "Unit Prices."

F. Allowance No. 6: Quantity Allowance: (8) lineal feet of stone crack repair
   1. Coordinate quantity allowance adjustment with unit-price requirements in
      Section 012200 "Unit Prices."

G. Allowance No. 7: (5) stone patches
   1. Coordinate quantity allowance adjustment with unit-price requirements in
      Section 012200 "Unit Prices."

END OF SECTION 012100
SECTION 012200 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. This project may require extended work hours in order to meet the completion date. See Specification Section 00210 for Phasing and Schedule Requirements.
   B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. Section includes administrative and procedural requirements for unit prices.
   B. Related Requirements:
      1. Section 01280 for procedures for submitting and handling Change Orders.
      2. Section 01400 "Quality Requirements" for general testing and inspecting requirements.

1.3 DEFINITIONS
   A. Unit price is a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES
   A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
   B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
   C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

A. Unit Price 1: Repointing of existing historic brick masonry.
   1. Description: Removal and replacement of deteriorated exterior brick joints, as required, according to Section 040120 “Maintenance of Unit Masonry”.
   2. Unit of Measurement: Per spare foot, based on quantity required removed.
   3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."

B. Unit Price No. 2: Repointing of existing historic stone masonry.
   1. Description: Removal and replacement of deteriorated exterior brick joints, as required, according to Section 040140 "Maintenance of Stone Assemblies”.
   2. Unit of Measurement: Lineal foot of mortar, based on quantity required removed.
   3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."

C. Unit Price No. 3: Limestone block removal and reinstall
   1. Description: Remove reset, flush with existing, anchor, and repoint limestone block.
   2. Unit of Measurement: Per block
   3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."

D. Unit Price No. 4: Crack repair of existing historic stone masonry
   1. Description: Repair of existing cracks in stone masonry, as required by injection, according to Section 040140 “Maintenance of Stone Assemblies”.
   2. Unit of Measurement: Lineal foot
   3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."

E. Unit Price No. 5: Patch of spalling, and plugging holes, in areas of existing historic stone masonry.
1. Description: Repair of existing area in stone masonry, as required, according to Section 040140 "Maintenance of Stone Assemblies".
2. Unit of Measurement: per occurrence
3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."

F. Unit Price No. 6: New sealant joints in brick and stone (in kind)
1. Description: Replacement of existing sealant joint in stone and masonry with a new sealant joint.
2. Unit of Measurement: Lineal foot
3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."

G. Unit Price No. 7: New sealant joints in brick and stone (mortar removal)
1. Description: Replacement of existing mortar joint in stone and masonry with a new sealant joint.
2. Unit of Measurement: Lineal foot
3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."

H. Unit Price No. 8: Replacement of timber beams indicated on 4/A2.6 (Tudor gable area)
1. Description: Removal and replacement of gable roof framing and tudor style elements shown on elevations
2. Unit of Measurement: Board foot
3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."

I. Unit Price No. 9: Replacement of 1x wood fascia boards or not indicated on drawings
1. Description: Removal and replacement of gable end fascia boards, not indicated on the drawings, at 30’s and 50’s slate roofs (Approximately 1x4 to be verified)
2. Unit of Measurement: Linear ft
3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."

J. Unit Price No. 10: Steel brick lintels - replacement
1. Description: Replacement of loose steel brick lintels at areas not indicated on the drawings. Steel replacement to include salvage and reinstallation of brick above.
2. Unit of Measurement: Each typical opening of 6 foot width

K. Unit Price No. 11: Steel lintel restoration
1. Description: Clean corrosion and repaint existing steel lintel
2. Unit of Measurement: per lineal foot
L. Unit Price No. 12: Replacement of slate roof shingle
   1. Description: Removal and replacement of slate roof shingles not shown on the drawings. Exclude from price material cost of slate.
   2. Unit of Measurement: Each tile

M. Unit Price No. 13: Removal of metal shingle straps
   1. Description: Removal of existing metal shingle strapping not shown on the drawings.
   2. Unit of Measurement: Each strap

N. Unit Price No. 14: Slate tile material
   1. Description: Material cost of slate tile (as needed beyond the owner’s existing stockpile to tiles – see plans for location of stockpile on roof)
   2. Unit of Measurement: Each tile

END OF SECTION 012200
1.1 SUMMARY

A. Section Includes
   1. Submittal procedures.

B. Related Sections
   1. Section 01310 - Progress Schedules
   2. Section 01400 - Quality Control
   3. Section 01630 - Product Options and Substitutions
   5. Document 00700 – General Conditions of the Contract

1.2 SUBMITTAL PROCEDURES

A. Submit schedule of submittals within 3 working days of receiving Notice of Contract Award. Submittal schedule to include proposed submittal number, specification section, title and anticipated date of submission.

B. All submittals to be submitted for approval within 30 days of Notice of Contract Award.

C. Transmit submittals to Owner’s Representative using Owner’s Representative approved format. Electronic PDF submittals are to be used when possible.

D. Number the submittals using the specification number from the specifications. Resubmittals shall have original number with an alphabetic suffix.

E. Identify Project, Contractor, Subcontractor or supplier; name and telephone number of individual to contact for additional information; pertinent Drawing sheet and detail number(s), specification section number, as appropriate, and date of submission.

F. Apply Contractor’s stamp, signed or initialed, certifying that review, verification of products required, field dimensions, adjacent construction work, and coordination of information, is in accordance with the requirements of the work and Contract Documents.

G. Submit product data sheets which clearly designate which of the items on the sheet is being provided. Cross all other items out to clarify the submittal.

H. Submit color charts in proper quantities of original color materials; photocopied reproductions will not be accepted.

I. Fully coordinate material prior to submittal. Determine and verify field dimensions and conditions, catalog numbers, and similar data. Coordinate with public agencies involved and secure necessary approvals; signify that approvals have been secured by stamp or other means. Coordinate with the various types of work involved; make submittals in groups containing all associated items.

J. Submit product submittals required by individual sections of the specifications. Submittals not required by the specifications, but made at the option of the Contractor, will be returned without review unless accompanied by written, valid justification.
K. Schedule submittals to expedite the Project and deliver to Owner’s Representative. Coordinate submission of related items. Allow a minimum of 15 calendar days for processing.

L. Make complete product submittals. Include shop drawings, product data, samples, manufacturer’s instructions and manufacturer’s certificates as required in individual specification sections. Partial submittals will be rejected as not complying with Contract Documents. Manufacturer’s certificates based on tests or inspections at time of manufacture may be submitted separately.

M. Identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of the completed work. State whether submitted product is the specified product or an accepted substitution. Shop drawings and product data indicating substitutions which have not been previously accepted will be returned without review.

N. Provide space for Contractor, Owner’s Representative, and Architect/Engineer review stamps.

O. Submit in PDF format.

P. The Architect will review the submittals; mark the submittals with required revisions; stamp the submittals and indicate "No Exceptions Taken," "Make Corrections Noted," "Revise and Resubmit," "Rejected" or "Submit Specified Item" and return the submittal.

Q. Review the returned submittals and take appropriate action as indicated. If submittals are marked "Revise and Resubmit," "Rejected" or "Submit Specified Item," make revisions necessary, identify revisions with a 'cloud' and resubmit in same manner and number as for the original submittal.

R. The Architect will review the resubmittal and take action, as appropriate, in the same manner as for the original submittal.

S. Review the returned resubmittal and take appropriate action as indicated. Continue to revise and resubmit until Architect returns resubmittal marked "No Exception Taken" or "Make Corrections Noted." Said marks signify final action.

T. Following final action by the Architect, provide copies of submittals for concerned parties including District, Job Superintendent and appropriate subcontractors. Instruct parties to promptly report any inability to comply with provisions.

U. Use only those submittals which bear stamps showing final review of the Contractor, the Architect and appropriate Architect’s consultant, as appropriate.

V. If deviations, discrepancies or conflicts between the shop drawings/submittals and contract documents are discovered either prior to or after the shop drawings/submittals are processed by the Architect, the contract documents shall control over the shop drawings/submittals.

1.3 PRODUCT DATA/MATERIAL LIST

A. Submit the number of copies which the Contractor requires, plus six (6) copies which will be retained of any submittal which cannot be made by PDF.
B. Submit manufacturer's most recently published catalog sheets, brochures, drawings, schedules, performance charts, illustrations and other standard descriptive data.

1. Modify submittal in a neat and orderly fashion to delete information which is not applicable to Project.

2. Supplement standard information to provide additional information applicable to Project.

3. Make note of dimension and clearances required.

4. Make note of performance characteristics and capacities.

1.4 SAMPLES

A. Submit the size of samples specified in individual specification sections. Submit the number of samples which the contractor requires, plus two (2) of which will be retained. Contractor to retain Owner copy of sample at project site.

B. Submit samples to illustrate functional and aesthetic characteristics of the Product, with integral parts and attachment devices. Coordinate sample submittal for interfacing work.

C. Submit samples of finishes from the full range of manufacturer's standards of selected custom colors, textures and patterns for Architect's selection.

D. Where samples have natural variation in texture, color and dimension, submit samples showing extreme range plus the middle variation.

E. Erect Field Samples and Mock-Ups at the Project site at location acceptable to Owner’s Representative and Architect. Construct each sample or mock-up complete, including work of all trades required in finished work.

1.5 SHOP DRAWINGS

A. Submit in the form of one reproducible transparency and five opaque reproductions if submittal cannot be made by PDF or CAD. Opaque reproductions will be retained by the Owner’s Representative and Architect.

B. State or indicate data necessary to describe the product or system. Present in a clear and thorough manner.

C. Identify field dimensions; show relation to adjacent or critical features, work or products.

D. Title each drawing with SMOUSE OPPORTUNITY SCHOOL EXTERIOR IMPROVEMENTS and number.

E. After review, reproduce and distribute in accordance with article on procedures above and for Record Documents described in Section 01700, Contract Closeout.

1.6 MANUFACTURER’S INSTRUCTIONS AND CERTIFICATES

A. When specified in individual specification sections, submit manufacturer's printed instruction for delivery, storage, assembly, installation, start-up, adjusting, finishing in quantities specified for Product Date.

B. Identify conflicts between manufacturer's instructions and Contract Documents.

C. Submit manufacturer's certifications based on recent or previous test results with other submittals specified. Submittal certifications based on tests or inspections at time of manufacture with product delivery.
D. When specified in individual specification sections, submit manufacturer’s certificate for review in quantities specified for Product Data.

E. Indicated material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

F. Certificates may be recent or previous test results on material or Product, but must be acceptable to Architect.

1.7 PATTERNS AND COLORS

A. Unless the exact pattern and color of a product is indicated in the Contract Documents whenever a choice of pattern or color is available for a product, submit accurate color charts and pattern charts in the required number of original color or patterns for review and selection.

1.9 SUBMITTAL TIMELINE

A. The following submittals are due within 24 hours of Bid Time:
   1. Targeted Small Business Participation Form (Document 00312)
   2. Non-Collusion Affidavit (Document 00313)
   3. Bidder Status Form (Document 00314)
   4. Personnel Acknowledgement and Certification (Document 00315)
   5. List of Subcontractors and Suppliers

B. The following submittals are due 10 working days after Notice of Contract Award:
   1. Preliminary Construction Schedule
   2. Certificate of Insurance
   3. Bond
   4. Schedule of Submittals
   5. Copy of Contractor’s Safety Program
   6. Copy of Contractor’s Jobsite Staging Plan

C. The following submittals are due 10 working days prior to first Application for Payment:
   1. Schedule of Values
   2. Construction Progress Schedule
   3. Security Program (section 01500 para. 1.21)

D. The following submittals are due 30 calendar days after Notice of Contract Award:
   1. Balance of all required Project submittals

E. The submittal log will be maintained by the Contractor.

PART 2 - PRODUCTS

Not used
Not used

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY
A. Section Includes
   1. Format.
   2. Content.
   3. Revisions to Schedules.
B. Related Sections
   1. Section 01040 - Coordination and Meetings: Project Meetings.

1.2 FORMAT
A. Prepare Schedules as a horizontal bar chart or CPM with separate bar for each major portion of Work or operation, identifying first workday of each week.
B. Use commercially available software for producing schedule. Provide electronic document to Owner's Representative if requested.
C. Sequence of listing: The chronological order of the start of each item of work.
D. Scale and Spacing: To provide space for notations and revisions.

1.3 CONTENT
A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
B. Identify each item by specification Section number.
C. Identify work by separate stages and logically grouped activities.
D. Provide sub-schedules to define critical portions of the entire Schedule.
E. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
F. Show coordination with District work and other contractors.
G. Show the network schedule logic on the schedule form of a CPM (or table if a bar chart is used).
H. Indicate Critical Path of project activities on the project schedule.

1.4 REVISIONS TO SCHEDULES
A. Indicate progress of each activity to date of submittal, and projected completion date of each activity.
B. Identify activities modified since previous submittal, major changes in scope and other identifiable changes.
C. Provide narrative report to define problem areas, anticipated delays and impact on Schedule. Report corrective action taken, or proposed, and its effect.
1.5 SUBMITTALS

A. Submit Preliminary Construction Schedule within 10 working days after date of Notice of Award.

B. Construction Progress Schedule to be submitted and accepted prior to first Application for Payment.

C. After the Owner’s Representative has accepted the Construction Progress Schedule, it shall become the basis for determining scheduled completion of the project.

D. Submit updated Construction Progress Schedules with each Application for Payment.

E. Submit the schedule by electronic distribution.

1.6 DISTRIBUTION

A. Distribute copies of Project Construction Schedule to project site file, Subcontractors, suppliers, and other concerned parties.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in Schedules.

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

Not used

END OF SECTION
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. This project may require extended work hours in order to meet the completion date. See Specification Section 00210 for Phasing and Schedule Requirements.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes general protection and treatment procedures for historic spaces, areas, rooms, and surfaces in entire project, and the following specific work:

1. Historic removal and dismantling.

B. Related Requirements:

1. Section 040120 "Maintenance of Unit Masonry" for specific requirements for cleaning and repairing clay masonry.
2. Section 040140 "Maintenance of Stone Assemblies" for specific requirements for cleaning and repairing stone.
3. Section 090190 "Maintenance of Painting and Coating" for specific requirements for stripping and repainting of decorative paint finishes.

1.3 DEFINITIONS

A. Consolidate: To strengthen loose or deteriorated materials in place.

B. Dismantle: To disassemble and detach items by hand from existing construction to the limits indicated, using small hand tools and small one-hand power tools, so as to protect nearby historic surfaces; and legally dispose of dismantled items off-site, unless indicated to be salvaged or reinstalled.

C. Existing to Remain: Existing items that are not to be removed or dismantled.

D. Historic: Spaces, areas, rooms, surfaces, materials, finishes, and overall appearance which are important to the successful preservation as determined by Architect. Designated historic areas and surfaces are indicated on Drawings and scheduled in this Section.
E. Match: To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by Architect.

F. Reconstruct: To remove existing item, replicate damaged or missing components, and reinstall in original position.

G. Refinish: To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.

H. Reinstall: To protect removed or dismantled item, repair and clean it as indicated for reuse, and reinstall it in original position, or where indicated.

I. Remove: Specifically for historic spaces, areas, rooms, and surfaces, the term means to detach an item from existing construction to the limits indicated, using hand tools and hand-operated power equipment, and legally dispose of it off-site, unless indicated to be salvaged or reinstalled.

J. Repair: To correct damage and defects, retaining existing materials, features, and finishes while employing as little new material as possible. Includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.

K. Replace: To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.

L. Replicate: To reproduce in exact detail, materials, and finish unless otherwise indicated.

M. Reproduce: To fabricate a new item, accurate in detail to the original, and in either the same or a similar material as the original, unless otherwise indicated.

N. Restore: To consolidate, replicate, reproduce, repair, and refinish as required to achieve the indicated results.

O. Retain: To keep existing items that are not to be removed or dismantled.

P. Reversible: New construction work, treatments, or processes that can be removed or undone in the future without damaging historic materials unless otherwise indicated.

Q. Salvage: To protect removed or dismantled items and deliver them to Owner, ready for reuse, or relocated as indicated.

R. Stabilize: To provide structural reinforcement of unsafe or deteriorated items while maintaining the essential form as it exists at present; also, to reestablish a weather-resistant enclosure.

S. Strip: To remove existing finish down to base material unless otherwise indicated.
A. Historic items, relics, and similar objects other items of interest or value to Owner that may be encountered during removal and dismantling work remain Owner's property. Carefully dismantle and salvage each item or object, instructed to be removed. Protect items, otherwise, to remain in place.

1.5 INFORMATIONAL SUBMITTALS

A. Construction Schedule for Historic Treatments: Indicate for entire Project the following for each activity to be performed in historic spaces, areas, and rooms, and on historic surfaces:
   1. Use of elevator and stairs.
   2. Coordination of Owner's and others' continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

B. Preconstruction Documentation: Show preexisting conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by Contractor's historic treatment operations.

C. Historic Treatment Program: Submit before work begins.

1.6 QUALITY ASSURANCE

A. Historic Treatment Preconstruction Conference: Conduct conference at Project site.

1. General: Review methods and procedures related to historic treatment including, but not limited to, the following:

   a. Review manufacturer's written instructions for precautions and effects of historic treatment procedures on materials, components, and vegetation.
   b. Review and finalize historic treatment construction schedule; verify availability of materials, equipment, and facilities needed to make progress and avoid delays.
   c. Review qualifications of personnel assigned to the work and assign duties.
   d. Review areas where existing construction is to remain and requires protection.

2. Removal and Dismantling:

   a. Inspect and discuss condition of construction to be removed or dismantled.
   b. Review requirements of other work that relies on substrates exposed by removal and dismantling work.
1.7 STORAGE AND PROTECTION OF HISTORIC MATERIALS

A. Historic Materials for Reinstallation:
   1. Repair and clean historic items as indicated and to functional condition for reuse.
   2. Pack or crate items after cleaning and repairing; cushion against damage during handling. Label contents of containers.
   3. Protect items from damage during transport and storage.
   4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment unless otherwise indicated. Provide connections, supports, and miscellaneous materials to make item functional for use indicated.

B. Existing Historic Materials to Remain: Protect construction indicated to remain against damage and soiling from construction work. Where permitted by Architect, items may be dismantled and taken to a suitable, protected storage location during construction work and reinstalled in their original locations after historic treatment and construction work in the vicinity is complete.

C. Storage and Protection: When taken from their existing locations, catalog and store historic items within a weathertight enclosure where they are protected from wetting by rain, snow, condensation, or ground water, and from freezing temperatures.
   1. Identify each item with a nonpermanent mark to document its original location. Indicate original locations on plans elevations, sections, or photographs by annotating the identifying marks.
   2. Secure stored materials to protect from theft.

1.8 PROJECT CONDITIONS

A. General Size Limitation in Historic Spaces: Materials, products, and equipment used for performing the Work and for transporting debris, materials, and products shall be of sizes that clear surfaces within, areas, and openings, including temporary protection, by 12 inches or more.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with removal and dismantling work.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
   1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Owner. Owner will remove hazardous materials under a separate contract.

E. Storage or sale of removed or dismantled items on-site is not permitted.
A. Coordinate historic treatment procedures in this Section with public circulation patterns at Project site. Some work is near public circulation patterns cannot be closed off entirely, and in places can be only temporarily redirected around small areas of work. Plan and execute the Work accordingly.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 HISTORIC REMOVAL AND DISMANTLING EQUIPMENT

A. Removal Equipment: Use only hand-held tools except as follows or unless otherwise approved by Architect on a case-by-case basis:

1. Light jackhammers are allowed subject to Architect's approval.
2. Large air hammers are not permitted.

B. Dismantling Equipment: Use manual, hand-held tools, except as follows or otherwise approved by Architect on a case-by-case basis:

1. Hand-held power tools and cutting torches are permitted only as submitted in the historic treatment program. They must be adjustable so as to penetrate or cut only the thickness of material being removed.
2. Pry bars more than 18 inches long and hammers weighing more than 2 lb are not permitted for dismantling work.

3.2 EXAMINATION

A. Preparation for Removal and Dismantling: Examine construction to be removed or dismantled to determine best methods to safely and effectively perform removal and dismantling work. Examine adjacent work to determine what protective measures will be necessary. Make explorations, probes, and inquiries as necessary to determine condition of construction to be removed or dismantled and location of utilities and services to remain that may be hidden by construction that is to be removed or dismantled.

1. Verify that affected utilities have been disconnected and capped.
2. Inventory and record the condition of items to be removed and dismantled for reinstallation or salvage.
3. Before removal or dismantling of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.
B. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs and preconstruction video.

C. Perform surveys as the Work progresses to detect hazards resulting from historic treatment procedures.

3.3 PROTECTION, GENERAL

A. Comply with temporary barrier requirements in Section 01500 "Temporary Facilities and Controls."

B. Ensure that supervisory personnel are on-site and on duty when historic treatment work begins and during its progress.

C. Protect persons, motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from historic treatment procedures.

1. Use only proven protection methods, appropriate to each area and surface being protected.
2. Provide barricades, barriers, and temporary directional signage to exclude public from areas where historic treatment work is being performed.
3. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during course of historic treatment work.
4. Contain dust and debris generated by removal and dismantling work and prevent it from reaching the public or adjacent surfaces.
5. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.
6. Protect floors and other surfaces along haul routes from damage, wear, and staining.
7. Provide supplemental sound-control treatment to isolate removal and dismantling work from other areas of the building.

D. Temporary Protection of Historic Materials:

1. Protect existing historic materials with temporary protections and construction. Do not deface or remove existing materials.
2. Do not attach temporary protection to historic surfaces except as indicated as part of the historic treatment program and approved by Architect.

E. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.

F. Utility and Communications Services:

1. Notify Owner, Architect, authorities having jurisdiction, and entities owning or controlling wires, conduits, pipes, and other services affected by the historic treatment work before commencing operations.
2. Disconnect and cap pipes and services as required by authorities having jurisdiction, as required for the historic treatment work.

3. Maintain existing services unless otherwise indicated; keep in service, and protect against damage during operations. Provide temporary services during interruptions to existing utilities.

G. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Architect immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is in working order.

1. Prevent solids such as stone or mortar residue from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from historic treatment work.

2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

H. Existing Roofing: Prior to the start of work in an area, install roofing protection.

3.4 PROTECTION DURING APPLICATION OF CHEMICALS

A. Protect motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm or damage resulting from applications of chemical cleaners and paint removers.

B. Cover adjacent surfaces with protective materials that are proven to resist chemicals selected for Project unless chemicals being used will not damage adjacent surfaces as indicated in historic treatment program. Use covering materials and masking agents that are waterproof, UV resistant, and will not stain or leave residue on surfaces to which they are applied. Apply protective materials according to manufacturer's written instructions. Do not apply liquid masking agents or adhesives to painted or porous surfaces. When no longer needed, promptly remove protective materials staining.

C. Do not apply chemicals during winds of sufficient force to spread them to unprotected surfaces.

D. Neutralize and collect alkaline and acid wastes and legally dispose of off Owner's property.

E. Collect and dispose of runoff from chemical operations by legal means and in a manner that prevents soil contamination, soil erosion, undermining of paving and foundations, damage to landscaping, or water penetration into building interior.

3.5 GENERAL HISTORIC TREATMENT

A. Ensure that supervisory personnel are present when historic treatment work begins and during its progress.
B. Halt the process of deterioration and stabilize conditions unless otherwise indicated. Perform work as indicated on Drawings. Follow the procedures in subparagraphs below and procedures approved in historic treatment program:

1. Retain as much existing material as possible; repair and consolidate rather than replace.
2. Use additional material or structure to reinforce, strengthen, prop, tie, and support existing material or structure.
3. Use reversible processes wherever possible.
4. Use historically accurate repair and replacement materials and techniques unless otherwise indicated.
5. Record existing work before each procedure (preconstruction) and progress during the work with digital preconstruction documentation photographs.

C. Notify Architect of visible changes in the integrity of material or components whether due to environmental causes including biological attack, UV degradation, freezing, or thawing; or due to structural defects including cracks, movement, or distortion.

1. Do not proceed with the work in question until directed by Architect.

D. Where missing features are indicated to be repaired or replaced, provide features whose designs are based on accurate duplications rather than on conjectural designs, subject to approval of Architect.

E. Where Work requires existing features to be removed or dismantled and reinstalled, perform these operations without damage to the material itself, to adjacent materials, or to the substrate.

F. Identify new and replacement materials and features with permanent marks hidden in the completed work to distinguish them from original materials. Record a legend of identification marks and the locations of the items on record Drawings.

3.6 HISTORIC REMOVAL AND DISMANTLING

A. Removing and Dismantling Items on or near Historic Surfaces:

1. Unfasten items to be removed, in the opposite order from which they were installed.
2. Support each item as it becomes loosened to prevent stress and damage to the historic surface.
3. Dismantle anchorages.

B. Masonry Walls:

1. Remove masonry carefully and erect temporary bracing and supports as needed to prevent collapse of materials being removed.
2. Dismantle top edge and sides before removing wall. Stop removal work and immediately inform Architect if any structural elements above or adjacent to the work show signs of distress or dislocation during any phase of removal work.
3. Remove wall in easily managed pieces.
4. During removal, Contractor is responsible for the stability of the partially remaining wall. Notify Architect of the condition of temporary bracing for wall if work is temporarily stopped during the wall’s removal.

C. Steelwork:

1. Expose structural steel for examination by Architect and Contractor’s professional engineer before proceeding with removal or dismantling.
2. If distress in structure is apparent during performance of the work, stop removal or dismantling and take immediate precautionary measures to ensure safety of the structure. Inform Architect of the problem, steps taken, and proposed corrective actions.
3. Brace and support structural steel being removed and remaining during removal and dismantling.
4. Concrete-Encased Steel: Where steel is known to be encased by concrete being removed, saw cut with blades that will cut no deeper than the thickness of the concrete cover with an adequate margin for error in the location of the steel. Isolate sections of concrete by saw cutting before beginning removal.

3.7 HISTORIC REMOVAL AND DISMANTLING SCHEDULE

A. (reserved)

3.8 HISTORIC TREATMENT SCHEDULE

A. Areas, surfaces requiring special care and treatment to ensure successful, preservation, rehabilitation, restoration, and reconstruction are indicated on Drawings and generally described below.

1. Existing brick and stonework as shown on drawings and outlined in these specifications.
2. Existing concrete balconies with metal guardrails. Existing metal ‘French’ door entrances to courtyards.
3. Existing interior hallways and associated building entrance doors used to access courtyard restoration areas.
4. Existing wood door restoration work as shown on drawings and indicated in these specifications.
5. Existing wood window mullion restoration on the southwest elevation as shown on drawings and indicated in these specifications.
6. Existing wood ‘Tudor’ gable end framing (of slate roofed building section) as shown on drawings and indicated in these specifications.
END OF SECTION 013591
1.1 SECTION INCLUDES

A. Quality assurance and control of installation.
B. References.
C. Field samples.
D. Mock-up.
E. Inspection and testing laboratory services.
F. Manufacturers' field services and reports.

1.2 RELATED SECTIONS

A. Section 01090 - Reference Standards.
B. Section 01300 - Submittals: Submission of Manufacturers' Instructions and Certificates.
C. Section 01410 - Testing Laboratory Services
D. Section 01600 - Material and Equipment: Requirements for material and product quality.

1.3 QUALITY ASSURANCE/CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship to produce Work of specified quality.
B. Comply fully with manufacturers' instructions, including each step in sequence.
C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Owner’s Representative before proceeding.
D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes or specified requirements indicate higher standards or more precise workmanship.
E. Perform work by persons qualified to produce workmanship of specified quality.
F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.4 REFERENCES

A. Conform to reference standards in effect on date of Contract Documents unless otherwise specified in product Sections.
B. Obtain copies of standards when required by Contract Documents.
C. 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.

1.5 FIELD SAMPLES

A. Install field samples at the site as required by individual specification sections for review.
B. Acceptable samples represent a quality level for the Work.
C. Where field sample is specified in individual sections to be removed, clear area after field sample has been accepted by Architect.
1.6 MOCK-UP

A. Mock-ups shall be prepared in a timely manner to allow review and acceptance by the Owner’s Representative, Owner and Architect.

B. Assemble and erect specified items, with specified attachment and anchorage devices, flashings, seals and finishes.

C. Where mock-up is specified in individual Sections to be removed, clear area after mock-up has been accepted by Architect.

1.7 INSPECTION AND TESTING LABORATORY SERVICES

A. Owner will appoint, employ and pay for services of an independent firm to perform inspection and testing.

B. The independent firm will perform inspections, tests, and other services specified in individual specification sections and as required by the Architect.

C. Reports will be submitted by the independent firm to the Architect and Owner’s Representative in writing indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.

D. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage and assistance as requested.

1. Notify Architect, Inspector and Owner’s Representative 48 hours prior to expected time for operations requiring services.

2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.

1.8 MANUFACTURERS' FIELD SERVICES AND REPORTS

A. Submit qualifications of observer to Owner’s Representative 30 days in advance of required observations. Observer subject to approval of Owner’s Representative and Architect.

B. When specified in individual specification sections, require material or product suppliers or manufacturers to provide: qualified staff personnel to observe site conditions, conditions of surfaces and installation; quality of workmanship; start-up of equipment; test, adjust, and balance of equipment; and other as applicable, and to initiate instructions when necessary.

C. Individuals to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

D. Submit report in triplicate within 30 days of observation to Owner’s Representative for review.

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

Not used

END OF SECTION
1.1 SECTION INCLUDES
   A. District provided testing laboratory services.
   B. Contractor provided testing and inspection services.

1.2 RELATED SECTIONS
   A. Section 01700 - Contract Closeout: Record documents.
   B. Individual Specification Sections: Inspections and tests required, and standards for testing.
   C. Divisions 15 and 16 - Mechanical and Electrical: Testing, adjusting and balancing of mechanical and electrical systems.

1.3 SELECTION AND PAYMENT
   A. The District will employ and pay for the services of testing to conduct required tests and inspections for the project.

      1. Soils: The District will employ and pay for the services of a Soils Engineer to observe excavating, grading, and filling operations and to provide testing of soil materials as specified in individual sections of this specification. The Soils Engineer will have management, laboratory and field supervisory personnel with minimum 5 years experience in testing and inspection of soils materials and will have adequate facilities, equipment, and technical references to permit performance of testing and inspections within applicable regulations and standards.

      2. Other Construction: The District will employ and pay for the services of a testing laboratory to conduct tests, inspections, and special inspections as required and as specified in individual sections of this specification.

         a. For construction requiring testing and inspection other than special inspection. The testing laboratory will have management, laboratory and field supervisory personnel with minimum 5 years experience in testing and inspection of work and materials of construction and will have adequate facilities, equipment, and technical references to permit performance of testing and inspections within applicable regulations and standards.

   B. Re-testing: Per paragraph G.C. 20, when initial tests indicate non-compliance with the Contract Documents, subsequent re-testing occasioned by the non-compliance shall be performed by the same testing agency and the costs thereof will be deducted by the District from the Contract Sum by Change or Field Order.

   C. Re-testing Covered Work: Re-examination of previously tested and inspected work may be ordered by the Architect and by the Owner. The Contractor shall uncover such work if re-testing is ordered. If work is found in accordance with Contract Documents, the District will pay costs of uncovering, removing, re-testing and replacing. If work is found not in accordance with Contract Documents, the District will deduct the cost of re-testing from the Contract Sum by Change Order and the Contractor will bear the costs of uncovering, removing and replacing work.

   D. Testing and inspecting performed for Contractor’s convenience, such as testing and inspection to establish equivalence of substitutions, equivalence of repairs to damaged
materials, and testing and inspecting to expedite the operations, shall be the Contractor's responsibility.

1. The Contractor shall employ a licensed professional engineer of the discipline required to develop a testing program that will establish equivalency.

2. The Contractor shall submit the testing program to the Architect for review.

3. The Contractor shall arrange testing in accordance with the accepted testing program to be performed by the District's testing laboratory.

4. The costs of testing done by the District's testing laboratory for the Contractor will be deducted from the Contract Sum by Change Order.

5. The Contractor may not arrange for testing upon portions of the work already completed except with the written consent of the Architect.

E. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

F. The Architect shall have the right to make tests at any time on materials or work done whether those materials are specified or substituted items.

1.4 AGENCY RESPONSIBILITIES

A. Provide qualified personnel at site. Cooperate with Program Manager, Architect, and Contractor in performance of services.

B. Perform specified sampling and testing of materials in accordance with specified standards.

C. Ascertain compliance of materials and mixes with requirements of Contract Documents.

D. Promptly notify Program Manager, Architect, and Contractor of observed irregularities and non-conformance of work and products.

E. Perform additional tests required by Architect.

F. Attend Preconstruction Meeting. Attend Progress Meetings as requested.

G. Provide quantity estimates for all work associated with unforeseen conditions.

1.5 AGENCY REPORTS

A. Test/Inspection Reports:

1. Include every test and inspection made regardless of whether such tests and inspections indicate that the material and procedures are satisfactory or unsatisfactory.

2. Provide documentation describing scope of additional work associated with unforeseen conditions.

3. Include records of special sampling operations as required.

4. Indicate specified design strength of materials such as masonry, concrete and steel.

5. State whether or not materials and procedures comply with requirements of the Construction Documents.

6. Submit copies of reports to Program Manager, District, Architect, Structural Engineer, Civil Engineer, Soils Engineer and/or Contractor as applicable within 14
days of tests. Submit copies of reports of non-complying materials and procedures immediately.

1.6 LIMITS ON AGENCY AUTHORITY

A. Agency or laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
B. Agency or laboratory may not approve or accept any portion of the work.
C. Agency or laboratory may not assume any duties of Contractor.
D. Agency or laboratory has no authority to stop work.

1.7 CONTRACTOR RESPONSIBILITIES

A. Package and deliver to laboratory at designated location adequate samples of materials proposed to be used which require testing. Samples shall be selected by laboratory personnel. Allow proper time for selecting samples, and making tests or considerations.
B. Cooperate with laboratory personnel, and provide access to work and to manufacturer's facilities.
C. Provide incidental labor and facilities to provide access to work to be tested, to obtain and handle samples as selected by laboratory personnel at the site or at source of products to be tested, to facilitate tests and inspections, and for storage and curing of test samples.
D. Notify Program Manager and Architect, minimum 24 hours prior to expected time for operations requiring inspection and testing services. Do not allow work to be covered prior to inspection and testing.

1.8 SCHEDULE OF INSPECTIONS AND TESTS

A. Testing Certificates Provided by Contractor as required:
   1. Mill test reports for reinforcing steel.
   2. Mill test reports for cement.
   3. Weighmasters tickets for each load of transit mixed concrete.
   4. Weighmasters affidavit.
   5. Certifications of welders.
   6. Certifications of materials.
B. Initial Testing Provided by Owner as required:
   1. Site Clearing: Test compaction of excavation backfill.
   2. Earthwork:
      a. Sample and test fill and base materials for compliance with specified requirements.
      b. Inspect placement of engineered fill.
      c. Inspect bottoms of footings and foundation trenches.
      d. Test compaction of each layer of engineered fill.
   3. Trenching:
4. Asphalt Concrete Paving:
   a. Sample and test quality of paving and base if directed by Program Manager and Architect.
   b. Test compaction of paving and base if directed by Program Manager and Architect.

5. Portland Cement Concrete Paving:
   a. Review mix designs.
   b. Sample and test compressive strength of concrete.
   c. Sample and test slump of concrete.

6. Concrete Reinforcing:
   a. Inspect placement and installation of reinforcing steel.
   b. Inspect field welding of reinforcing steel.

7. Cast-In-Place Concrete:
   a. Sample and test cement.
   b. Sample and test aggregate.
   c. Review mix designs and confirm mix design proportions with weighmaster.
   d. Perform initial batch plant inspection.
   e. Inspect concrete placement.
   f. Sample and test slump of concrete.
   g. Test air content of concrete.
   h. Sample and test concrete for compressive strength.
   i. Test concrete for shrinkage.

8. Structural Steel:
   a. Inspect shop and field welding.
   b. Test full penetration welds.

9. Metal Fabrications:
   a. Inspect shop and field welding of load bearing fabrications.
   b. Test full penetration welds in load bearing fabrications.

10. Fire caulking:
    a. Inspection by city certified inspection agency.
    b. Test in accordance with accepted practice.

C. Initial Testing Performed by Owner's Testing Laboratory at Owner's Cost: The cost of the following initial tests, if required, will be deducted by the Owner from the Contract Sum by Change Order.
SMOUSE OPPORTUNITY SCHOOL EXTERIOR IMPROVEMENTS

1. Testing to establish equivalence of material not properly identified.
2. Testing to establish equivalence of substitutions.
3. Testing required in order to expedite Contractor’s operations.
4. Testing relating to repair of work which fails to meet specifications.
5. Testing and inspection required to correct damage to material in shipping and erection.

PART 2 - PRODUCTS
Not Used

PART 3 - EXECUTION
Not Used

END OF SECTION
1.1 SUMMARY

A. Section Includes

1. Temporary Utilities: Electricity, lighting, heat, ventilation, telephone service, water service and sanitary facilities.

2. Temporary Controls: Barriers, fencing, water, noise and vibration control, dust and mud control, traffic control, interior and exterior enclosures, protection of installed work, security and fire protection.

3 Construction Facilities: Access roads, parking, progress cleaning, project identification, field offices and storage sheds, and construction aids.

B. Related Sections

1. Section 01700 - Contract Closeout: Final Cleaning.


1.2 REFERENCES

A. ASTM E84 - Surface Burning Characteristics of Building Materials.


1.3 SUBMITTALS

A. Submit under the provisions of Section 01300.

1.4 TEMPORARY ELECTRICITY

A. Contractor shall provide all additional materials required for temporary power (e.g. spider boxes, temporary panels and feeder cables) and to provide labor to relocate the panels as required for the project. Contractor shall provide the labor to tie in the temporary panels to the main switchboard and to provide periodic service and maintenance to the temporary panels.

B. Temporary electrical power will be available at the project site from existing outlets and panels. Contractor will replace damaged receptacles damaged by construction activities at no cost to the District.

C. Owner will pay cost of energy used. Contractor shall exercise measures to conserve energy.

D. Should the existing electrical power not be sufficient, Contractor will arrange with the utility company to provide the additional service required and pay the costs associated with providing the additional service or to provide generators. The Contractor will pay cost of this energy used.

Permanent convenience receptacles may be used during construction. Any devices damaged during construction shall be replaced at no cost to the Owner.

1.5 TEMPORARY LIGHTING (See Section 1.4)

1.6 TEMPORARY HEAT

A. The contractor shall supply any temporary heating systems and fuel required for the addition area to allow the continuous progression of the exterior and interior work on the
building. Contractor to install and maintain construction phase filters to prevent dust from entering the systems.

1.7 TEMPORARY VENTILATION

A. Each Trade Contractor shall be responsible for providing adequate forced ventilation of enclosed areas for proper installation and curing of materials, to disperse humidity, and to prevent hazardous accumulations of dust, fumes, vapors and gases.

1.8 TEMPORARY TELEPHONE SERVICE

A. The Contractor will be responsible for their phone / communications services.

B. Trade Contractor’s Project Manager and on-site Project Supervisor shall carry mobile telephones with them during all work hours of the project and be available by phone during off hours for emergencies. Mobile phone numbers to be made available to the Owner prior to start of construction.

1.9 TEMPORARY WATER SERVICE

A. The contractor can use the existing water services for ordinary uses. Contractor is responsible for getting water from the closest existing water source.

B. Owner will pay cost of water used for ordinary uses. Exercise measures to conserve water.

C. Contractor to provide water by tank truck or by hydrant meter for watering sod. Contractor to pay for water used.

1.10 SANITARY FACILITIES

A. The contractor shall provide temporary chemical toilets for the use of their workmen.

B. Existing and permanent sanitary facilities shall not be used.

1.11 BARRIERS

A. Contractor’s, as required, shall provide temporary barriers as detailed below:

1. Provide temporary barriers to prevent unauthorized entry to construction / building areas and to protect existing facilities and adjacent properties from damage from construction operations.

2. Provide barricades as required by governing authorities for public rights of way and for public access.

3. Provide barriers around trees and plants designated to remain. Provide temporary fencing around drip line of trees designated to remain. Protect against vehicular traffic, stored materials, dumping, chemically injurious materials and puddling or continuous running water. Replace damaged plant life. Maintain existing tree and plant barriers and at the conclusion of construction operations remove temporary tree and plant barriers as directed by the Owner.

4. Provide barricades around trenches. Barricade trenches less than 6 inches deep with warning tape. Cover trenches 6 inches deep and greater subject to pedestrian traffic with plywood covers or barricade with chain link fence as specified below. Cover trenches subject to vehicular traffic with suitable steel cover or barricade with chain link fence as specified below.

B. Relocate barriers as required by progress of work.
C. Maintain temporary barriers in a structurally sound condition with a neat, orderly appearance. Observe temporary barriers daily for safety compliance.

D. Protect non-owned vehicular traffic, stored materials, site and structures from damage.

E. Walkways and Barricades: If Contractor's portion of work interferes with pedestrians on the streets, provide pedestrian walkway protection and wood barricades conforming to City standards and requirements.

1.12 TEMPORARY FENCING

A. Temporary fencing is required as necessary to secure contractor work areas, storage areas and to protect the public. Temporary fencing and gates are to be installed and removed by the contractor. All fencing shall be 6' high chain link with a top rail and new fabric. It shall be installed sound, maintained during its use and removed when work is complete.

1.13 CONTROL OF WATER

A. Each trade Contractor shall be responsible for water control as detailed below.

1. Rainwater shall be prevented from entering the facilities while work is underway. Rainwater, surface or subsurface water, or other fluid, shall not be permitted to accumulate in excavations or under or about the structures. Should such conditions develop or be encountered, the areas affected shall be de-watered with temporary pumps, piping, ditches, dams or other methods at the expense of the Trade Contractor.

2. Grade site to drain. Maintain excavations free of water. Provide, operate and maintain pumping equipment.

3. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

1.14 NOISE AND VIBRATION CONTROL

A. Contractor shall insure noise and vibrations generated through the completion of the Work do not affect educational activities. The contractor and their subcontractors shall modify work schedules, at no cost to the owner, if necessary to prevent disruptions to educational activities.

B. Contractor shall comply with applicable regulatory requirements for the operation of powered equipment as detailed below.

C. Equipment and impact tools shall have intake and exhaust mufflers.

D. Cooperate with the Owner if the use of noisy and vibratory equipment becomes objectionable.

E. Speakers / radios will not be permitted.

1.15 DUST AND MUD CONTROL

A. Contractor shall be responsible for controlling dust and mud during construction.

1. Execute Work by methods to minimize raising dust from construction operations.

2. Conform with applicable Federal, State and Local regulatory requirements and ordinances concerning dust control.

3. Contractor shall be responsible for additional cleaning required in in portions of the building outside of the work area that are impacted by dust and debris generated
B. Provide positive means to prevent airborne dust from dispersing into atmosphere.
C. Remove mud originating from construction site from city streets and sidewalks.

1.16 TRAFFIC CONTROL
A. Contractor: Furnish, erect and maintain sufficient warning and directional signs, barricades and warning lights and sufficient flag people to give adequate warning of construction to vehicular traffic at all times.
B. Coordinate lane closures with appropriate government agencies.
C. Maintain a minimum number of travel lanes for traffic specified by appropriate government agencies.

1.17 EXTERIOR ENCLOSURES
A. Contractor shall be responsible for exterior enclosures as detailed below.
   1. Provide temporary insulated weather-tight closures of openings in exterior surfaces to provide acceptable working conditions and protection for materials, to allow for temporary heating and maintenance of ambient temperatures identified in individual specification sections and to prevent entry of unauthorized persons. Provide doors with self-closing hardware and locks.
   2. Provide temporary roofing as required.

1.18 INTERIOR ENCLOSURES
1. Provide temporary dust and traffic control enclosures to prevent dust and debris from entering unaltered areas and to protect the public.
2. Certain interior enclosures shall be installed at the start of the project.

1.19 PROTECTION OF INSTALLED WORK
A. Contractor shall be responsible for protection of installed work as detailed below.
   1. Protect installed work and provide protection from damage.
   2. Provide temporary protection for installed products. Control activity in immediate work area to minimize damage.
   3. Provide protective coverings at walls, projections, jambs, sills and soffits of openings.
   4. Protect finished floors, stairs and other surfaces from traffic, dirt, wear, damage and movement of heavy objects by protecting with durable sheet materials.
   5. Prohibit traffic from landscaped areas.

1.20 PROTECTION OF EXISTING FACILITIES
A. Contractor shall be responsible for protection of existing facilities as detailed below.
   1. Provide temporary protection for existing facilities as specified for installed work.
   2. Replace or repair pipes, conduits and conductors broken or severed as a result of construction activities by the end of the workday in which they were broken or
3. Become familiar with existing conditions of all systems to remain. Provide temporary connections as required to maintain systems. Protect systems during construction. Provide temporary tie-in pipes, conduits and conductors as required to maintain systems completely operational during construction.

4. The trade contractor shall be responsible for the protection of tops, trunks, and root systems of existing trees and shrubs on the project site. Install planking with 2 x 4’s to 8’ minimum height to protect existing tree trunks on the project site that may be subject to construction damage. Installation of protective structure shall be made before any work is started and not removed until directed by the Owner. Alternate method is to fence around the drip lines of the trees.

Do not permit heavy equipment or stockpiles within the branch spread. No ropes, wires, cables, or other devices shall at any time be affixed to a tree or shrub so as to damage the bark, break branches, or destroy its natural shape.

The Trade Contractor shall be liable in cases of accidental damage to trees and shrubs that are to remain on the site.

The Trade Contractor shall notify the Owner immediately in cases of accidental damage so that the proper repairs can be made. Cost of such repairs will be assessed to the Trade Contractor. The Trade Contractor shall not attempt to make such repairs himself.

Evaluation of trees or shrubs damaged beyond repair shall be made on the basis of replacement cost, if replaceable, with material of equal size. In cases where it would not be possible to replace a tree with one of equal size, trees shall be evaluated on the basis on the "Shade Tree Evaluation" formula of the International Shade Tree Conference, current edition.

5. Maintain existing plumbing, mechanical, electrical, security, intercom and fire alarm systems operational at all times.

1.21 SECURITY

A. Contractor shall be responsible for the security of its own equipment and materials on the job site.

B. Provide sufficient security program and facilities to protect work, existing facilities and Owner operations within construction area from unauthorized entry, vandalism and theft.

C. Secure, maintain and protect the work, stored materials, equipment and temporary facilities until time of acceptance, or such earlier time as Owner may choose to assume such responsibility.

D. Contain and secure construction equipment and materials to satisfaction of the Owner.

E. Submit security program to Owner for review and coordination.

1.22 TEMPORARY FIRE PROTECTION

A. Provide and maintain fire extinguishers, fire hoses and other equipment necessary for fire protection.

B. Designate use and use such equipment for fire protection only.

1.23 LAWN AREAS
1. Contractor's vehicles may not be driven into lawn areas without prior approval of the Owner. In those cases where it is necessary to drive such a vehicle or vehicles, the Contractor shall provide planking material upon which to drive. The Contractor shall be held responsible for any damages incurred.

2. Lawn areas which are disturbed by construction shall be repaired to the satisfaction of the Owner and paid for by the Contractor.

1.24 PARKING
A. Contractor: The contractor may utilize school parking lots during non school hours. All other parking shall be off site.

1.25 PROGRESS CLEANING
A. Contractor shall provide all measures to secure debris and provide dumpsters for removal from the site.
B. Contractor shall maintain all work areas free of waste materials, debris and rubbish. Maintain site in a clean and orderly condition by removing waste materials weekly or more frequently as required. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces and other closed or remote spaces, prior to enclosing the space. Broom and vacuum clean interior areas prior to start of surface finishing and continue cleaning to eliminate dust.
C. Contractor shall supply labor for a general job site cleanup each Friday. The buildings shall be brought to a broom clean condition and all debris shall be deposited in the dumpsters. Break cartons and containers down for better use of dumpsters.

1.26 STORAGE
A. Trade contractors shall store all their materials onsite in a manner not to interfere with the work of any other trade contractor. Trade contractors shall move their stored materials as required for the work of all to proceed.

1.27 CONSTRUCTION AIDS
A. Furnish, operate and maintain a complete plant for fabricating, handling, conveying, installing, and erecting materials and equipment required under the Contract. Include elevators, hoists, derricks and conveyances for transportation of workers and transporting and placing materials and equipment necessary for performance of the work.
B. Maintain plant and equipment in safe and efficient operating condition. Repair damage due to defective plant and equipment and use thereof at no increase in Contract Sum.
C. Furnish, erect, and maintain for duration of work, scaffolds, runways, guardrails, platforms and similar temporary construction necessary for the performance of work. Such facilities shall be of type and arrangement required, structurally sound and well secured.

1.28 REMOVAL OF UTILITIES, FACILITIES AND CONTROLS
A. Remove temporary above grade or buried utilities, materials, equipment and facilities prior to inspection at completion.
B. Clean and repair damage caused by installation or use of temporary facilities.
C. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

1.29 TEMPORARY CONTROLS
A. Temporary Construction, Equipment and Protection
   1. Protection: Contractor must protect all workers and equipment from power lines and maintain safe distances and protective devices as required by OSHA.
   2. Temporary construction and equipment: Temporary construction and equipment shall conform to regulations, ordinances, laws and other requirements of authorities having jurisdiction, including insurance companies, with regards to safety precautions, operation and fire hazard.

B. Pollution Control
   1. Provide methods, means and facilities to prevent contamination of soil, water and atmosphere from discharge of noxious, toxic substances and pollutants produced by construction operations.
   2. Waste solvents, oils and other materials which may be harmful to people, plant life, or the environment, shall be removed from the site in containers and disposed of in accordance with applicable laws and regulations.
   3. Erect, maintain and remove silt fencing and other erosion control measures as required.

C. Safety
   1. Contractor shall submit Company Safety Plan 10 days after Notice of Award under the Provisions of Section 01300.

PART 2 - PRODUCTS
   Not used

PART 3 - EXECUTION
   Not used

END OF SECTION
1.1 SUMMARY
A. Section Includes
   1. Products.
   2. Transportation and handling.
   3. Storage and protection.
B. Related Sections
   1. Section 01400 - Quality Control: Product quality monitoring.
   2. Section 01630 - Substitutions.

1.2 PRODUCTS
A. Products: Means new materials, machinery, components, equipment, fixtures and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse.
B. Do not reuse materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.
C. Provide interchangeable components of the same manufacturer, for similar components.

1.3 TRANSPORTATION AND HANDLING
A. Transport and handle products in accordance with manufacturer's instructions.
B. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.
C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.4 STORAGE AND PROTECTION
A. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures.
B. For exterior storage of fabricated products, place on sloped supports, above ground.
C. Provide off-site storage and protection when site does not permit on-site storage or protection.
D. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.
E. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
F. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement or damage.
G. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.
DES MOINES INDEPENDENT COMMUNITY SCHOOL DISTRICT
SMOUSE OPPORTUNITY SCHOOL EXTERIOR IMPROVEMENTS

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION
PART 1 GENERAL

1.1 SECTION INCLUDES
   A. Contractor’s options in selection of products.
   B. Requests for substitution of products.

1.2 RELATED SECTIONS
   B. Document 00800 - Supplementary Conditions
   C. Section 01040 - Coordination: Applicability of specified reference standards; coordination of construction.
   D. Section 01300 - Submittals: Proposed products list; product data submittals.
   E. Section 01700 - Contract Closeout: Record documents operation and maintenance data.

1.3 OPTIONS (Based on scope of project and products specified for use, review listed options below and coordinate with General Conditions 3.11.4.)
   A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards.
   B. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not specifically named.
   C. Products Specified by Naming Several Manufacturers: Products of named manufacturers meeting specifications; no substitutions of products by other manufacturers allowed.
   D. Products Specified by Naming Only One Manufacturer: No option due to necessity to match existing products or systems; no substitutions allowed.

1.4 LIMITATIONS ON SUBSTITUTIONS
   A. Requests for substitutions of products will be considered only during the bid period per G.C. - 35. Subsequent requests will be considered only in case of product unavailability or other conditions beyond control of Contractor.
   B. Substitutions will not be considered when indicated on shop drawings or product data submittals without separate formal request, when requested directly by subcontractor or supplier, or when acceptance will require substantial revision of Contract Documents.
   C. Substitute products shall not be ordered or installed without written acceptance.
   D. Only one request for substitution for each product will be considered. When substitution is not accepted, provide specified product.
   E. Architect and Owner will determine acceptability of substitutions.
   F. Substitutions shall not extend the contract completion date.

1.5 REQUESTS FOR SUBSTITUTIONS
   A. Submit separate request for each substitution. Document each request with complete data substantiating compliance of proposed substitution with requirements of Contract Documents.
B. Identify product by Specifications section and Article numbers. Provide manufacturer's name and address, trade name of product, and model or catalog number. List fabricators and suppliers, as appropriate.

C. Attach product data as specified in Section 01300.

D. List similar projects using product, dates of installation and names of Architect/Engineer and Owner.

E. Give itemized comparison of proposed substitution with specified product, listing variations and reference to Specifications section and Article numbers.

F. Give quality and performance comparison between proposed substitution and the specified product.

G. Give cost data comparing proposed substitution with specified product and amount of net change to Contract Sum.

H. List availability of maintenance services and replacement materials.

I. State effect of substitution on construction schedule and changes required in other work or products.

J. State if use of proposed substitutions is subject to payment of license fee or royalty.

K. Submit sample of manufacturer's standard form of guarantee or warranty for proposed substitution.

1.6 CONTRACTOR REPRESENTATION

A. Request for substitution constitutes a representation that Contractor:

1. Has investigated proposed product and has determined that it is equal to or superior in all respects to specified product or that the cost reduction offered is ample justification for accepting the offered substitution.

2. Will provide same warranty for substitution as for specified product.

3. Will coordinate installation of accepted substitute, making such changes as may be required for work to be complete in all respects.

4. Will pay additional costs generated by an accepted substitution, including the cost of the Architect's additional services associated with reviewing and incorporating the substitution.

B. Contractor certifies that:

1. Cost data presented is complete and includes all related costs under this Contract.

2. Substitution is in full compliance with the Contract Documents and applicable regulatory requirements.

C. Contractor waives claims for additional costs related to substitution which may later become apparent.

1.7 SUBMITTAL PROCEDURES

A. Submit three copies of request for substitution.

B. Requests for substitutions will be reviewed and Contractor notified in writing of Owner’s decision to accept or reject requested substitution no later than five (5) calendar days before bid.
C. For accepted products, submit shop drawings, product data and samples under provisions of Section 01300.

PART 2  PRODUCTS

Not used.

PART 3  EXECUTION

Not used.
To: Studio Melee  
1312 Locust Street, Suite 100Z  
Des Moines, IA 50309

PROJECT: SMOUSE OPPORTUNITY SCHOOL EXTERIOR IMPROVEMENTS

Email: Dave Abler dave@studiomelee.com

We hereby submit for your consideration the following product as substitute for specified item for the above project:

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
<th>Paragraph/Line</th>
<th>Specified Item</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

Proposed Substitution: ____________________________________________

Attach complete product description, drawings, photographs, performance and test data, warranty, information and other information necessary for evaluation. Identify specific model numbers, finishes, options, etc.

A. Will changes be required to building design or drawing dimensions in order to properly install proposed substitution? Yes___ No___. If yes, explain.

B. Will the undersigned pay for changes to the building design, including engineering and drawings costs, caused by requested substitution? Yes___ No___.

C. Differences between proposed substitution and specified item. ____________________________

D. What affect does substitution have on other trades? ____________________________

E. Does manufacturer's warranty of the proposed substitution differ from that specified? Yes___ No___.
   If yes, explain ____________________________

__________________________________________

January 26, 2004
PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Starting systems.
B. Demonstration and instructions.

1.2 RELATED SECTIONS

A. Section 01400 - Quality Control: Manufacturers field reports.
B. Section 01700 - Contract Closeout.

1.3 STARTING SYSTEMS

A. Coordinate schedule for start-up of various equipment and systems.
B. Notify Owner’s Representative seven days prior to start-up of each item.
C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence or other conditions which may cause damage.
D. Verify that tests, meter readings and specified electrical characteristics agree with those required by the equipment or system manufacturer.
E. Verify wiring and support components for equipment are complete and tested.
F. Execute start-up under supervision of responsible manufacturer’s technical representative in accordance with manufacturers’ instructions.
G. When specified in individual specifications sections, require manufacturer to provide authorized representative to be present at site to inspect, check and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
H. Submit a written report in accordance with Section 01400 that equipment or system has been properly installed and is functioning correctly.

1.4 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of Products to Owner's personnel two weeks prior to date of Substantial Completion.
B. Demonstrate Project equipment and instruct in a classroom environment located at the site and instructed by a qualified representative who is knowledgeable about the Project.
C. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owners' personnel in detail, to explain all aspects of operation and maintenance.
D. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance and shutdown of each item of equipment at scheduled times, at designated location.
E. All demonstrations and training sessions of equipment/products/systems by qualified personnel shall be video recorded by the Contractor. Two copies of the video recording shall be turned over to the Owner’s Representative.
F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
G. The amount of time required for instruction on each item of equipment and system is that specified in individual sections.

PART 2 - PRODUCTS
Not used

PART 3 - EXECUTION
Not used

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Closeout procedures.
B. Final cleaning.
C. Adjusting.
D. Project Record Documents.
E. Operation and maintenance data.
F. Instruction of District personnel.
G. Warranties and bonds.
H. Certification of Asbestos-Free Construction.
I. Spare parts and maintenance materials.
J. Restoration of damaged work.
K. Remedial work.
L. Keys

1.2 RELATED SECTIONS

A. Section 01040 - Project Meetings
B. Section 01500 - Construction Facilities and Temporary Controls: Progress cleaning
C. Section 01650 - Commissioning of Systems
D. Document 00700 – General Conditions

1.3 CLOSEOUT PROCEDURES

A. Submit written certification that Contract Documents have been reviewed, work has been inspected, and work is complete in accordance with Contract Documents and ready for Architect’s inspection.
B. Provide submittals to Architect required by governing or other authorities.
C. At the conclusion of the work and before final payment is made, furnish to the Owner a list with the names, contact persons, addresses and telephone numbers, of all the subcontractors and material suppliers who furnished labor and materials on the project. The list shall include identification of the services rendered and of the materials provided by each subcontractor.
D. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due. Deliver Project Record Documents, Warranties and Bonds, Certification of Asbestos-Free Construction, Spare Parts and Maintenance Materials, final Operation and Maintenance Data at one time with final Application for Payment, and full releases from all subcontractors and suppliers.

1.4 FINAL CLEANING

A. Contractor shall perform the following cleaning:
   1. Execute cleaning prior to final inspection.
2. Comply with applicable regulatory requirements during cleaning and disposal operations.

3. Use cleaning materials which will not create hazards to health or property or cause damage to products or work.

4. Use cleaning materials and methods recommended by the manufacturers of the products to be cleaned.

5. Schedule operations to prevent dust and other contaminants resulting from cleaning operations from adhering to wet or newly finished surfaces.

6. Remove grease, stains, fingerprints, labels, spilled and spattered materials and other foreign materials from interior and exterior surfaces exposed to view including glazing.

7. Remove waste and surplus materials and rubbish from the site.

8. Leave areas which have been entered during the course of the work in a neat condition, free from debris, weeds and material not called for in the Construction Documents.

9. Wash and clean interior and exterior glass and window frames.

B. Contractor shall perform final cleaning of the equipment installation. This clean up will include:

   1. Wash and shine and polish glossy surfaces to a clear shine.
   2. Vacuum and wipe insides of casework.
   3. Vacuum and mop floor
   4. Clean equipment and fixtures to a sanitary condition.
   5. Clean new and existing surfaces, equipment and fixtures within project area.

1.5 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

1.6 PROJECT RECORD DOCUMENTS

A. Maintain on site, one set of the following record documents; record actual revisions to the work:

   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed shop drawings, product data and samples.
   6. Construction schedule.

B. Store Record Documents separate from documents used for construction. Label each document "Project Record" in neat, large printed letters. Do not use Project Record Documents for construction.
C. Maintain Project Record Documents in a clean dry, legible condition and in good order.

D. Record information concurrent with construction progress. Do not conceal any work until required information is recorded.

E. Record information initially on set of opaque Drawings and in a copy of Project Manual provided by the District. Transfer information from opaque Drawings to reproducible Drawings provided by the District.

F. Make Project Record Documents available to Owner’s Representative, and Architect at all times.

G. Architect will review Project Record Documents at each billing meeting. Status of Project Record Documents will be considered in evaluating proposed monthly billings.

H. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name, the product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by addenda and modifications.

I. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Changes made by addenda and modifications.
   3. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements such as column lines and walls.
   4. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the work.
   5. Measured locations of items, not necessarily concealed, which have been changed from locations shown on Contract Documents.
   6. Deviations from sizes, locations, and other features of installations shown in the Contract Documents.
   7. Details not on original Contract Drawings.

J. Construction Schedule: Submit a Final Construction Progress Schedule based on the latest, updated progress revised to indicate actual dates and durations of the various construction activities.

K. Submit documents to Owner’s Representative with final Application for Payment. Provide in format as acceptable to Architect.

1.7 OPERATION AND MAINTENANCE DATA

A. Operations and maintenance manuals shall be submitted in an electronic PDF format on a disc.

B. Prepare covers with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS," title of project and subject matter of if multiple discs are required.

C. Internally subdivide the contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
D. Contents: Prepare a Table of Contents for each product or system description identified.

E. Part 1: Directory, listing names, addresses and telephone numbers of Architect, Engineer, Contractor, Subcontractors and major equipment suppliers.

F. Part 2: Operation and maintenance instructions arranged by specification section. For each category identify names, addresses and telephone numbers of Subcontractors and suppliers. Identify the following:
   1. Manufacturer's trade or brand name, catalog or model number and, where applicable, serial number,
   2. Significant design criteria.
   3. List of equipment.
   4. Parts list for each component.
   5. Operating instructions.
   6. Maintenance instructions for equipment and systems.
   7. Maintenance instructions for finishes, including recommended cleaning methods and materials and special precautions identifying detrimental agents.

G. Part 3: Project documents and certificates, including the following:
   1. Approved copies of shop drawings and product data.
   2. Air and water balance reports.
   3. Certificates.
   4. Photocopies of warranties and bonds.

H. Submit one copy of completed volumes in final form 15 days prior to final inspection. This copy will be returned after final inspection, with Architect comments. Revise content of documents as required prior to final submittal.

I. Submit final volumes revised, with final Application for Payment.

J. Provide data where specified in individual sections.

1.8 INSTRUCTION OF DISTRICT’S PERSONNEL

A. Where specified in individual specification sections, furnish qualified personnel for on-the-job instruction of the Owner's operation and maintenance personnel in accordance with section 01650.

B. Furnish instruction including special start-ups and running time prior to occupancy of subject areas. Furnish at no additional cost to Owner.

1.9 WARRANTIES AND BONDS

A. Warrant the entire work against defects in materials and workmanship for 12 months from date of acceptance. In addition, warrant or bond work as required in the individual specification sections.

B. Warranties between Contractor and manufacturers and between Contractor and suppliers shall not affect warranties between the Contractor and the District.
C. Submit warranties typed on the Contractor's letterhead if for the entire work and on the subcontractor's letterhead if for the work of a specification section. Use the form in Section 01710.

D. Provide original and two (2), notarized copies. Execute and assemble documents from subcontractors, suppliers and manufacturers. Verify compliance with Contract Documents. Provide table of contents and assemble in binder with durable plastic cover. Identify on or readable through the front cover with the SMOUSE OPPORTUNITY SCHOOL EXTERIOR IMPROVEMENTS and address, the Contractor's name and address and the title 'WARRANTIES AND BONDS.'

E. Submit all material with final Application for Payment. For equipment put into use with Owner's permission during construction, submit within ten days after first operation. For items of work delayed beyond Date of Substantial Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

1.10 CERTIFICATION OF ASBESTOS-FREE CONSTRUCTION
A. Certify that no materials containing asbestos were incorporated into the construction of work of the Contract.
B. Submit certification typed on Contractor's letterhead. Identify the project by name, address, District Job Number. See Section 01710 for form.

1.11 SPARE PARTS AND MAINTENANCE MATERIALS
A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification sections.
B. Deliver to project site prior to final payment and place in location as directed by Owner's Representative/Owner; obtain receipt.

1.12 RESTORATION OF DAMAGED WORK
A. Restore or replace, as specified or directed by the Architect, materials or finishes damaged from movement of equipment or other operations at no additional expense to the District.
B. Restore to match original work. Finishes shall match appearance of original adjacent work.

1.13 REMEDIAL WORK
A. Perform remedial work necessary due to faulty workmanship or materials at no additional expense to the District.
B. Coordinate remedial work with District. Perform at such time and in such manner to cause minimal interruption and inconvenience to the District's operation.

1.14 SERVICE AND MAINTENANCE CONTRACTS [for elevators, etc.]
A. Compile, review and submit specified service and maintenance contracts.
B. Provide in PDF format titled 'SERVICE AND MAINTENANCE CONTRACTS.'
C. Submit with warranties and bonds.

PART 2 - PRODUCTS
Not Used

PART 3 - EXECUTION
Not Used
PART 1 - GENERAL

1.1 SECTION INCLUDES
   A. Procedures
   B. Values of Closeout Requirements
   C. Forms

1.2 RELATED SECTIONS
   A. Document 00700 – General Conditions of the Contract
   B. Section 01700 - Contract Closeout
   C. Section 01710 – Contract Closeout Forms

1.3 PROCEDURES
   A. In compliance with Chapter 38 Section 13 of the Iowa Code the Owner allows for the Contractor to request the early release of retained funds.
   B. Prior to Owner’s release of any retained funds, the Contractor shall submit the following forms:
      1. Request for Release of Retained Funds (Section 01705 – Page 2)
      2. Notice of Contractor’s Request for Early Release of Retained Funds (Section 01705 – Page 3) (This form is to be completed by all subcontractors, sub-subcontractors and suppliers on the Project).
      3. Consent of Surety to Early Release of Retained Funds (Section 01705 – Page 4)

1.4 VALUES OF CLOSEOUT REQUIREMENTS
   A. The Owner has established monetary values of closeout requirements for this Project. The Owner will retain funds equal to 200% of the value of any of the following items that are not complete at the time of the request for release of retained funds. This is in addition to funds retained for incomplete construction and punch list items.
      1. Project Record Documents (Section 01700 – Section 1.6) Value $ 2,000.00
      2. Operation and Maintenance Data (Section 01700 – Section 1.7) Value $ 2,000.00

PART 2 - PRODUCTS
   Not Used

PART 3 - EXECUTION
   Not Used

END OF SECTION
REQUEST FOR RELEASE OF RETAINED FUNDS

OWNER

TO:  Des Moines Independent Community School District
     2100 Fleur Drive
     Des Moines, IA 50321

PROJECT:  _________________________________________________

FROM:  (Contractor)

This is to certify that I, ________________________________ am an authorized official of working in the capacity of ______________ and have been properly authorized by said firm or corporation to sign the following statements pertaining to the subject Contract:

On __________________, the project described above was designated substantially complete as provided for by Chapter 38 of the Iowa Code. As of __________________, the total amount retained by the Owner on this Contract is $___________________.

Pursuant to Iowa Code Chapter 38, Contractor is now making this formal request for the release of all / part (circle one) of the retained funds currently being withheld by the Owner on this Contract.

I know of my own personal knowledge, and do hereby certify, that at least ten (10) calendar days prior to filing this Request for Release of Retained Funds with the Owner, the required notice was given by the Contractor to all known subcontractors, sub-sub-contractors and suppliers on the Project that the Contractor was requesting the early release of retained funds. A signed copy of each said notice is attached hereto.

Notwithstanding this Request for Release for the Retained Funds, the Owner will continue to retain, as applicable:

a. an amount equal to 200% of the value of labor or materials yet to be provided on the Project which will include the value of the itemized costs for closeout phase items of the Project as listed in Section 01705 of the documents, as determined by the Owner through its authorized contract representative.

b. an amount equal to 200% of the value of any Chapter 573 claims currently on file at the time of this Request or as otherwise authorized by Iowa Code Chapter 573 Upon review by the Owner of this Request, any Chapter 573 claims on file, and the status of any work or materials still remaining to be provided on the Project, the Owner shall release all applicable retained funds at its next regularly scheduled board meeting or within thirty (30) days, whichever is less. The Contractor shall release the paid retained funds to the subcontractors and suppliers in the same manner as retained funds are released to the Contractor by the Owner. Each subcontractor shall pass through to each lower tier subcontractor or supplier all retained fund payments from the Contractor in the same manner.

If the Owner does not release all funds requested by the Contractor, Owner shall provide an itemization and/or reason(s) for the non-release to the Contractor within thirty (30) days of the Contractor’s request.

________________________________ __________________ ______________ ____________
CONTRACTOR    BY     DATE

STATE OF IOWA, ________________ COUNTY, ss:

Subscribed and sworn to before me by the said ___________________________ on this _____________ day of ________
______, ____________.

_____________________________________________ _____
Notary Public in and for the State of Iowa
NOTICE OF CONTRACTOR’S REQUEST FOR EARLY RELEASE OF RETAINED FUNDS

PART A - NOTICE:

You are hereby notified that __ (Contractor)________ will be requesting an early release of funds on a public improvement designated as ____ (Name of Project)______ for which you have or may have provided labor or materials. The request will be made pursuant to Iowa Code section 38.13. The request may be filed with the Des Moines Independent Community School District after ten calendar days from the date of this notice. The purpose of the request is to have the Des Moines Independent Community School District release and pay funds for all work that has been performed and charged to Des Moines Independent Community School District as of the date of this notice. This notice is provided in accordance with Iowa Code section 38.13.

This Notice was sent by ___(Contractor)________ on ______________, 202__.

This Notice was received by __________________________ on _______________, 202__.

_____________________________  
(Signature of Receiver)

PART B – SWORN STATEMENT:

The total aggregate value of our agreement, purchase order or Work on this Project to date is $__________________, of which we acknowledge receipt of total payments to date of $__________________.

The below stated entity, as a Subcontractor, Sub-Subcontractor and/or Supplier attests and certifies the amounts entered above are correct as of the date of this Affidavit, and: 1) that it has received Notice from the Prime Contractor that it intends to apply for partial (or full) Release of Retained Funds and/or Final Payment for the Project, 2) that it is current in payments received to date on this project, 3) that, as of this date, is not aware of any potential claims against the Project or the Owner, and 4) that it will submit all required final closeout substantiation and documents as required by the project documents for it’s area of the work within sixty calendar days.

_____________________________   ____________________ 
(/entity)      (Date)
CONSENT OF SURETY FOR RELEASE OF RETAINED FUNDS

TO OWNER: Des Moines Independent Community School District
PROJECT NO.: 2100 Fleur Drive
Des Moines, IA  50321

PROJECT: _________________________________________________________________

CONTRACTOR: _____________________________________________________________

In accordance with the provisions of the Contract between the Owner and the Contractor for the above project, the , SURETY, on bond number dated hereby approves of the release of retained funds of the Contractor as authorized by law, and agrees that the release of retained funds to the Contractor shall not relieve the Surety of any of its obligations to Des Moines Independent Community School District, 2100 Fleur Drive, Des Moines, Iowa, 50321, OWNER, as set forth in said Surety’s bond.

IN WITNESS WHEREOF, the Surety has hereunto set its hand on this date:

________________________________________
Surety

________________________________________
Signature of authorized representative

ATTEST:
________________________________________
(Seal): Printed name and title
CONTRACTOR’S CERTIFICATE OF SUBSTANTIAL COMPLETION

OWNER

TO: Des Moines Independent
Community School District
2100 Fleur Drive
Des Moines, IA 50321

ARCHITECT

PROJECT: 

FROM: __________________________________________ (Contractor)

This is to certify that I, __________________________________________, am an authorized official of ______________________ working in the capacity of ______________________ and have been properly authorized by said firm or corporation to sign the following statements pertaining to the subject contract:

I know of my own personal knowledge, and do hereby certify, that the work of the contract described above has been performed in accordance with, and in conformity to, the contract drawings and specifications. A list of all incomplete work is attached.

The Contractor hereby releases the Owner and its agents from all claims of and liability to the Contractor for anything done or furnished for or relating to the work, as specified in the Project Manual, except demands against the Owner for the remainder of progress payments retained to date, and unresolved written claims prior to this date.

The contract work is now substantially complete, ready for its intended use, and ready for your inspection.

A list of items to be completed or corrected is attached hereto. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

The Contractor will complete or correct the work on the list of items attached hereto within ________________ days from the above date of Completion.

_________________________________________  By  ___________________________  Date

Contractor

_________________________________________  By  ___________________________  Date

Architect

The Owner accepts the work or designated portion thereof as substantially complete and will assume full possession thereof at ________________ (time) on ________________ (date), which is also the date of commencement of applicable warranties required by the contract documents, except as stated below:

_________________________________________  By  ___________________________  Date

Des Moines Independent Community School District

This Document shall not become Valid until signed by the Contractor, Architect, and Owner
**CERTIFICATE OF FINAL ACCEPTANCE**

<table>
<thead>
<tr>
<th>PROJECT:</th>
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<tr>
<th>FROM: OWNER:</th>
<th>TO CONTRACTOR:</th>
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<tr>
<td>Des Moines Independent Community School District</td>
<td>Community School District</td>
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<tr>
<td>2100 Fleur Drive</td>
<td>2100 Fleur Drive</td>
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<tr>
<td>Des Moines, IA 50321</td>
<td>Des Moines, IA 50321</td>
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The Work performed under this contract has been reviewed and found, to the Owner’s Representative’s and Architect’s best knowledge, information and belief, to be complete, based on the Owner’s Representative’s and Architect’s on-site observations, inspections, and data gathered. The date of completion of the Project or portion thereof designated above is hereby established as

---

**Contractor**

By ___________________________  
Date __________________________

**Architect**

By ___________________________  
Date __________________________

The Owner accepts the work or designated portion thereof as complete and will assume full acceptance thereof at ________________ (time) on ________________ (date).

**DMPS Facility Management**

Des Moines Independent Community School District

By ___________________________  
Date __________________________

This Document shall not become Valid until signed by the Contractor, Architect, and Owner.
FINAL WAIVER AND RELEASE OF CLAIMS

TO ALL WHOM IT MAY CONCERN:

WHEREAS, the undersigned has been employed by Des Moines Independent Community School District to furnish labor and materials for (A) ______________________________ work, under a contract for the ______________________________ School in the City of Des Moines, County of Polk, State of Iowa, of which the Des Moines Independent Community School District is the Owner.

NOW THEREFORE, this _______ day of _____________, 20___, for and in consideration of the sum of (B) ___________________________ dollars paid simultaneously herewith, the receipt whereof is hereby acknowledged by the undersigned, the undersigned does hereby waive and release any claims*, liens, rights to, or claim of lien with respect to and on said above-described premises, and the improvements thereon, and on the monies or other consideration due or to become due from the Owner, on account of labor, services, materials, fixtures, apparatus or machinery heretofore or which may hereafter be furnished by the undersigned to or for the above-described premises by virtue of said contract.

(C)

(Name of sole ownership, corporation, or partnership)

(Signature of Authorized Representative)

(Title)

INSTRUCTIONS FOR FINAL WAIVER:

(A) Fill in nature and extent of work, strike the word labor or the word materials if not in your contract.

(B) Amount shown should be the amount actually received and equal to total amount of contract as adjusted.

(C) If waiver is for a corporation name should be used, and title of officer signing waiver should be set forth; if waiver is for a partnership, the partnership name should be used, partner should sign and designate himself as partner.

* The word claims as used herein shall include 573 Claims, Stop Orders, Stop Notices, or Freeze Orders on monies or other consideration of the Owner which are due or to become due on the Contract referenced above.
CONSENT OF SURETY TO FINAL PAYMENT

TO OWNER: Des Moines Independent Community School District
2100 Fleur Drive
Des Moines, IA 50321

PROJECT:

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the
SURETY, on bond of 
CONTRACTOR.

hereby approves of the final payment of the Contractor, and agrees that final payment to the Contractor shall not relieve the Surety of any of its obligations to Des Moines Independent Community School District, 2100 Fleur Drive, Des Moines, Iowa, 50321, OWNER, as set forth in said Surety’s bond.

IN WITNESS WHEREOF, the Surety has hereunto set its hand on this date:

________________________________________
Surety

________________________________________
Signature of authorized representative

ATTEST:

(Seal):

________________________________________
Printed name and title
CONTRACTOR’S AFFIDAVIT OF PAYMENT OF DEBTS AND CLAIMS AND RELEASE OF CLAIMS

TO OWNER: Des Moines Independent Community School District
2100 Fleur Drive
Des Moines, IA 50321

PROJECT NO:  

STATE OF: Iowa
COUNTY OF: Polk

The undersigned hereby certifies, except as listed below, payment has been made in full and all obligations have otherwise been satisfied for all materials and equipment furnished, for all work, labor, and services performed, and for all known indebtedness and claims against the Contractor for damages arising in any manner in connection with the performance of the contract referenced above for which the Owner or Owner’s property might in any way be held responsible or encumbered.

EXCEPTIONS:

The undersigned hereby further certifies that to the best of the undersigned’s knowledge, information and belief, except as listed below, the Release of Claims attached hereto include the Contractor, all subcontractors, all suppliers of materials and equipment, and all performers of Work, labor or services who have or may have 573 claims, or encumbrances or the right to assert claims or encumbrances against any property of the Owner arising in any manner out of the performance of the Contract referenced above.

EXCEPTIONS:
SUPPORTING DOCUMENTS ATTACHED

HERETO:

1. Consent of Surety to Final Payment. DMPSFM-640

BY: __________________________

Signature of authorized representative

Indicate attachment: yes no

______________________________

Printed Name and Title

The following supporting documents are attached:

1. Contractor’s Waiver and Release of Claims

2. Separate Waiver and Releases of Claims from Subcontractors and material and equipment suppliers accompanied by a list thereof.

______________________________

Subscribed and sworn before me on this date

Notary Public

______________________________

My Commission Expires
ARCHITECT’S CERTIFICATE OF SPECIFICATIONS

TO OWNER: Director, Facility Management
Des Moines Independent Community
School District
2100 Fleur Drive
Des Moines, IA 50321

The undersigned hereby certifies as follows:

1. The above referenced Project is finally completed; and
2. No asbestos or asbestos-containing material was specified as a building material in any Construction Documents for the Project; and
3. To the best of my knowledge, no asbestos or asbestos-containing material was used as a building material in the Project.

Architect

Date

Subscribed and sworn before me on this date

Notary Public

My Commission Expires
HAZARDOUS MATERIALS STATEMENT

THE FORM BELOW IS FURNISHED FOR THE CONVENIENCE OF EQUIPMENT OR MATERIALS MANUFACTURERS, DISTRIBUTORS, SUPPLIERS AND THE CONTRACTOR AND MAY BE REPRODUCED AS NECESSARY TO COMPLY WITH SUBMITTAL DOCUMENTATION AS DEFINED IN "SUPPLEMENTARY CONDITIONS".

I, ____________________________, ____________________________
(Name) (Title)
of ____________________________, do hereby declare that in completing the work of the Bid # ____________________________ for project ____________________________ at ____________________________, school, no manufactured materials assembly/device or item of construction will contain, or in itself is composed of, any materials listed (by Federal or State EPA or Federal or State health agencies) as a hazardous material.

________________________________________________________________________
Name

________________________________________________________________________
Title

________________________________________________________________________
Date

________________________________________________________________________
Subscribed and sworn before me on this date

________________________________________________________________________
Notary Public

________________________________________________________________________
My Commission Expires

THIS STATEMENT MUST BE NOTARIZED
WARRANTY FOR

We hereby warrant that the _________________________ which we have provided in the _________________________ has been completed in accordance with the requirements of Specification Section(s) _________________________ and the Contract Documents.

We agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced by so doing, that may prove to be defective in its workmanship or material within a period of _________________________ from the date of acceptance of the above named project by the Owner; and we also agree to repair any and all damages resulting from such defects, all without additional expense to the Owner, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with the above mentioned conditions within 30 days after being notified in writing by the Owner, we collectively or separately do hereby authorize the Owner to proceed to have such defective work repaired or replaced and made good at our expense, and we will honor and pay the costs and charges therefore upon demand.

Signed: _________________________ Date: _________________________
Subcontractor's name:
Address:
License Number:

Countersigned: _________________________ Date _________________________
Contractors name:
Address:
License Number:
or
Manufacturer's Name
Address:

OR

Signed: _________________________ Date: _________________________
Contractors name:
Address:
License Number:

THIS STATEMENT MUST BE NOTARIZED.
SECTION 024119 - SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. This project may require extended work hours in order to meet the completion date. See Specification Section 00210 for Phasing and Schedule Requirements.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Demolition and removal of selected portions of building or structure.
   2. Demolition and removal of selected site elements.
   3. Salvage of existing items to be reused or recycled.

B. Related Requirements:
   1. Section 011000 "Summary" for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements.
   2. Section 013591 "Historic Treatment Procedures" for historic removal and dismantling.
   3. Section 015639 "Temporary Tree and Plant Protection" for temporary protection of existing trees and plants that are affected by selective demolition.
   4. Section 017300 "Execution" for cutting and patching procedures.
   5. Section 311000 "Site Clearing" for site clearing and removal of above- and below-grade improvements.

C. The Smouse Opportunity school is listed on the National Register of Historic Buildings. All work performed by contractors and sub-contractors shall be in conformance with the National Park Service U.S. Department of the Interior's standards for Preservation and Rehabilitation. Technical preservation briefs are referenced in the specifications and available at: [http://www.nps.gov/tps/how-to-preserve/briefs.htm](http://www.nps.gov/tps/how-to-preserve/briefs.htm)

D. Chemical or physical treatments such as pressure washing or sandblasting that cause damage to historic materials shall not be used. Surface cleaning where required shall be undertaken with the gentlest means possible.
1.3 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.

C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at Project site.

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review structural load limitations of existing structure.
3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
5. Review areas where existing construction is to remain and requires protection.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For refrigerant recovery technician.

B. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property for environmental
protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.

C. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's tenants' on-site operations are uninterrupted.
2. Interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Use of elevator and stairs.
5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

D. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.

E. Pre demolition Photographs or Video: Submit before Work begins.

F. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

G. Warranties: Documentation indicated that existing warranties are still in effect after completion of selective demolition.

1.7 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged.

B. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.8 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.9 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
   1. Hazardous materials will be removed by Owner before start of the Work.
   2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

E. Hazardous Materials: Hazardous materials are present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
   1. Hazardous material remediation is specified elsewhere in the Contract Documents.
   2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
   1. If unanticipated asbestos is suspected, stop work in the area of potential hazard, shut off fans and other airhandlers ventilating the area, and rope off area until the questionable material is identified. Re-assign workers to continue work in unaffected areas. Resume work in the area of concern after safe working conditions are verified.

F. Historic Areas: Demolition and hauling equipment and other materials shall be of sizes that clear surfaces within historic spaces, areas, rooms, and openings, including temporary protection, by 12 inches or more.

G. Storage or sale of removed items or materials on-site is not permitted.

H. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
   1. Maintain fire-protection facilities in service during selective demolition operations.

1.10 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties. Notify warrantor before proceeding. Existing warranties include the following:
B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.

C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

E. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs and/or preconstruction videotapes and templates.

   1. Inventory and record the condition of items to be removed and salvaged. Provide photographs and/or video of conditions that might be misconstrued as damage caused by salvage operations.

   2. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.
3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
   1. Comply with requirements for existing services/systems interruptions specified in Section 015000 "Construction Facilities and Temporary Controls"

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
   1. Arrange to shut off indicated utilities with utility companies.
   2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
   3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.
      a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
      b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
      c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
      d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
      e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
      f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
      g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.

C. Refrigerant: Remove refrigerant from mechanical equipment to be selectively demolished according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
   1. Comply with requirements for access and protection specified in Section 015000 "Temporary Facilities and Controls."
B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
4. Cover and protect furniture, furnishings, and equipment that have not been removed.
5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 “Temporary Facilities and Controls.”

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

D. Temporary Partitions: Provide substantial construction designed by the contractor to provide effective protection of existing areas to remain as required.

1. Exterior closures: Weatherproof, constructed to prevent water leakage, insulated as required to prevent excessive heat loss or gain to existing building areas to remain, and sealed to prevent excessive air infiltration.
2. Interior closures: Isolate demolition operations from other areas. Seal joints and perimeter (including doors) against passage of dust and dirt.

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.

5. Maintain adequate ventilation when using cutting torches.

6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.

8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

B. Work in Historic Areas: Selective demolition may be performed only in areas of the Project that are not designated as historic. In historic spaces, areas, and rooms or on historic surfaces, the terms "demolish" or "remove" shall mean historic "removal" or "dismantling" as specified in Section 013591 "Historic Treatment Procedures."

C. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area on-site and/or off-site as designated by Owner.
5. Protect items from damage during transport and storage.

D. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstated in their original locations after selective demolition operations are complete.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete
from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.

B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, then remove concrete between saw cuts.

C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw then remove masonry between saw cuts.

D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

E. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings."

F. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight.

1. Remove existing roof membrane, flashings, copings, and roof accessories.
2. Remove existing roofing system down to substrate.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.7 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.
SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. This project may require extended work hours in order to meet the completion date. See Specification Section 00210 for Phasing and Schedule Requirements.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:

1. Footings.
2. Foundation walls.
3. Slabs-on-grade.
4. Concrete toppings.

B. Related Sections:
1. Section 312000 "Earth Moving" for drainage fill under slabs-on-grade.
2. Section 321313 "Concrete Paving" for concrete pavement and walks.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1. Indicate amounts of mixing water to be withheld for later addition at Project site.
C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

D. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
   1. Location of construction joints is subject to approval of the Architect.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and manufacturer.

B. Material Certificates: For each of the following, signed by manufacturers:
   1. Cementitious materials.
   2. Admixtures.
   3. Form materials and form-release agents.
   4. Steel reinforcement and accessories.
   5. Fiber reinforcement.
   6. Waterstops.
   7. Curing compounds.
   8. Floor and slab treatments.
  10. Adhesives.
  11. Vapor retarders.
  12. Semirigid joint filler.

C. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
   1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

D. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.

E. Field quality-control reports.

F. Minutes of pre-installation conference.
1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

B. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated. (Testing provided by owner.)

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

C. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."

E. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specifications for Structural Concrete,"
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

F. Concrete Testing Service: Owner shall engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

G. Pre-installation Conference: Conduct conference at project site.

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

   a. Contractor's superintendent.
   b. Independent testing agency responsible for concrete design mixtures.
   c. Ready-mix concrete manufacturer.
   d. Concrete subcontractor.
   e. Special concrete finish subcontractor.
2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semi-rigid joint fillers, forms and form removal limitations, shoring and re-shoring procedures, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

B. Water stops: Store water stops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Plywood, metal, or other approved panel materials.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.

D. Chamfer Strips: Wood, metal, PVC, or rubber strips, 1 by 1 inch, minimum.

E. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.


F. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that will leave no corroding metal closer than 1 inch to the plane of exposed concrete surface.
2. Furnish ties that, when removed, will leave holes no larger than 1 inch in diameter in concrete surface.
3. Furnish ties with integral water-barrier plates to walls indicated to receive damp-proofing or waterproofing.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
B. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.
C. Steel Bar Mats: ASTM A 184/A 184M, fabricated from ASTM A 615/A 615M, Grade 60, deformed bars, assembled with clips.
D. Plain-Steel Wire: ASTM A 82/A 82M, as drawn.
E. Deformed-Steel Wire: ASTM A 496/A 496M.
F. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from as-drawn steel wire into flat sheets.

2.3 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.
B. Zinc Repair Material: ASTM A 780, zinc-based solder, paint containing zinc dust, or sprayed zinc.
C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.
3. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.
2.4 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C 150, Type I.
   a. Fly Ash: ASTM C 618, Class F or C.
   b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

B. Silica Fume: ASTM C 1240, amorphous silica.

C. Natural sand fine aggregate and crushed limestone coarse aggregate: ASTM C33, clear, hard, durable and uncoated. Limit amounts of objectionable and deleterious materials per Iowa Department of Transportation standard specifications for highway and bridge construction, Series 2009, sections 4110, 4112 and 4115 for clay, coal, carbonaceous shale and chert. Aggregate shall meet IDOT specification 4115.01 for class 3i durability and 4115.01 for abrasion and objectionable materials. For exterior exposed surfaces, do not use fine or coarse aggregates containing spalling-causing substances. All interior slab on grade and topping concrete shall use fine aggregate from a source that has a successful history of producing concrete with little to no side effects related to lightweight particle pop-outs in slab on grade applications.

1. All aggregates to comply with IDOT Section 4112 and 4115 of standard specifications for highway construction.
3. Maximum Coarse-Aggregate Size: 1/2 inch nominal chip mix size aggregate at all slab and topping slab areas to receive polished concrete floors. Do not over vibrate or uniformly vibrate this concrete so as to cause variations in appearance at all areas for non-polished concrete floors.
5. Aggregates for non-exposed footings may be gravel or limestone.


2.5 ADMIXTURES


B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.6 VAPOUR RETARDERS

A. Sheet Vapor Retarder: ASTM E 1745, Class A, except with maximum perm rating of 0.04. Include manufacturer’s recommended adhesive or pressure-sensitive tape.

   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

      a. Carlisle Coatings & Waterproofing, Inc.; Blackline 400.
      d. Stego Industries, LLC; Stego Wrap 15 mil Class A.

B. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D 448, Size 57, with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.

C. Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D 448, Size 10, with 100 percent passing a 3/8-inch sieve, 10 to 30 percent passing a No. 100 sieve, and at least 5 percent passing No. 200 sieve; complying with deleterious substance limits of ASTM C 33 for fine aggregates.

2.7 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

      a. BASF Construction Chemicals - Building Systems; Confilm.
      b. Dayton Superior Corporation; Sure Film (J-74).
      c. Euclid Chemical Company (The), an RPM company; Eucobar.
      d. Meadows, W. R., Inc.; EVAPRE.
      e. Sika Corporation; SikaFilm.
      f. SpecChem, LLC; Spec Film.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.
E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. BASF Construction Chemicals - Building Systems; Kure 200.
   b. Dayton Superior Corporation; Day-Chem Rez Cure (J-11-W).
   c. Euclid Chemical Company (The), an RPM company; Kurez W VOX; TAMMSCURE WB 30C.
   d. Meadows, W. R., Inc.; 1100-CLEAR.
   e. SpecChem, LLC; Spec Rez Clear.

2.8 RELATED MATERIALS


B. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

C. Reglets: Fabricate reglets of not less than 0.022-inch-thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

D. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

2.9 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
   1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
   2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
   3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
   4. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109/C 109M.

B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.
1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.

2.10 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
   1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
   1. Fly Ash: 25 percent.
   4. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
   5. Silica Fume: 10 percent.
   6. Combined Fly Ash, Pozzolans, and Silica Fume: 35 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
   7. Combined Fly Ash or Pozzolans, Ground Granulated Blast-Furnace Slag, and Silica Fume: 50 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.06 percent by weight of cement.

D. Admixtures: Use admixtures according to manufacturer's written instructions.
   1. Use water-reducing high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
   2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
   3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
   4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
2.11 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Footings: Proportion normal-weight concrete mixture as follows:
   1. Minimum Compressive Strength: 3000 psi at 28 days.
   2. Maximum Water-Cementitious Materials Ratio: 0.45.
   3. Slump Limit: 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
   4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4 inch nominal maximum aggregate size.

B. Slabs-on-Grade: Proportion normal-weight concrete mixture as follows:
   1. Minimum Compressive Strength: 4000 psi at 28 days.
   3. Slump Limit: 4 inches, plus or minus 1 inch.
   4. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.

C. Concrete Toppings:
   1. Minimum Compressive Strength: 4000 psi at 28 days
   3. Design Slump: 4 inches, plus or minus 1 inch
   4. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.

2.12 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.13 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
   1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
   1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd.
3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
   2. Class B, 1/4 inch for rough-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
   1. Install keyways, reglets, recesses, and the like, for easy removal.
   2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3. Install dovetail anchor slots in concrete structures as required to attach masonry.

3.3 VAPOR RETARDERS

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.

1. Lap joints 6 inches and seal with manufacturer's recommended tape.

B. Granular Course: Cover vapor retarder with granular fill, moisten, and compact with mechanical equipment to elevation tolerances of plus 0 inch or minus 3/4 inch.

1. Place and compact a 1/2-inch-thick layer of fine-graded granular material over granular fill.

3.4 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.
C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

1. Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.5 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
D. Contraction Joints in Concrete Toppings: Form weakened-plane contraction joints only at joints of precast hollow-core planks. Topping slabs shall be sectioned to be relatively square panels. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.

2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

E. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.

2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Section 079200 "Joint Sealants," are indicated.

3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

3.6 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.

C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.

2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
3. Screed slab surfaces with a straightedge and strike off to correct elevations.
4. Slope surfaces uniformly to drains where required.
5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

G. Hot-Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.7 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces not exposed to public view.
B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces exposed to public view.

C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.8 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

1. Apply float finish to surfaces indicated.

C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces indicated.
2. Finish surfaces to the following tolerances, according to ASTM E 1155, for a randomly trafficked floor surface:
   a. Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-grade.

3. Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.-long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/8 inch.

D. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set method. While concrete is still plastic, slightly scarify surface with a fine broom.

1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

E. Broom Finish: Apply a broom finish to exterior concrete platforms, stoops, patios, steps, ramps, and elsewhere as indicated.
1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.9 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

3.10 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
   a. Water.
   b. Continuous water-fog spray.
c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

F. Permanently Exposed Slabs: Where slab on grade is permanently exposed to public view, slab shall be wet cured.

1. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
   a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
   b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
   c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.

2. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
   a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.

3. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.11 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

   1. Defer joint filling until concrete has aged at least one month. Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semi-rigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.
3.12 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect’s approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

   1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

   2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.

   3. Repair defects on concealed formed surfaces that affect concrete’s durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

   1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.

   2. After concrete has cured at least 14 days, correct high areas by grinding.

   3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.

   4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer’s written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.

   5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer’s written instructions to produce a smooth, uniform, plane, and level surface.
6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.13 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Inspections:

1. Steel reinforcement placement.
2. Steel reinforcement welding.
3. Headed bolts and studs.
4. Verification of use of required design mixture.
5. Concrete placement, including conveying and depositing.
6. Curing procedures and maintenance of curing temperature.
7. Verification of concrete strength before removal of shores and forms from beams and slabs.

C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mixture placed each day.

   a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at
least five randomly selected batches or from each batch if fewer than five are used.

3. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

4. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

5. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.

6. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

7. Compression Test Specimens: ASTM C 31/C 31M.
   a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
   b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.

8. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
   a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
   b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

9. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.

10. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

11. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

12. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

13. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive
strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.

14. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

15. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

END OF SECTION 033000
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. This project may require extended work hours in order to meet the completion date. See Specification Section 00210 for Phasing and Schedule Requirements.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:

1. Patching or overlay of interior and exterior horizontal surfaces and formed vertical and overhead surfaces with Portland Cement Concrete

2. Repair of existing courtyard balcony slabs

B. Related Sections:
1. Section 033000 CAST-IN-PLACE CONCRETE

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Submit two copies of manufacturer's literature, to include: Product Data Sheets (PDS), and appropriate Safety Data Sheets (SDS).

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and manufacturer.

B. Material Certificates: For each of the following, signed by manufacturers:

1.5 Quality Assurance

A. Contractor qualifications: Contractor shall be qualified in the field of concrete repair and protection with a successful track record of 5 years or more. Contractor shall maintain
qualified personnel who have received product training by a manufacturer's representative.

B. Store and apply materials in accordance with all safety and weather conditions required by manufacturer or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Consult Material Safety Data Sheets for complete handling recommendations.

1.6 WARRANTY

A. Provide a written warranty from the manufacturer against defects of materials for a period of one (1) year, beginning with date of substantial completion of the project.

1.7 DELIVERY, STORAGE, AND HANDLING

A. All materials must be delivered in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers. Damaged material must be removed from the site immediately.

B. Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use.

C. Condition the specified product as recommended by the manufacturer.

PART 2 - PRODUCTS

2.1 FORM AND POUR CONCRETE PATCH MATERIAL

A. Form and pour concrete patch material: Self consolidating, and polymer modified, comprised of selected portland cements, specially graded aggregates, admixtures for controlling setting time and plasticizers for workability as well as silica fume and a migrating corrosion inhibitor

1. SikaCrete®-211 SCC Plus, as manufactured by Sika® Corporation.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION

A. Areas to be repaired must be clean, sound, and free of contaminants. All loose and deteriorated concrete shall be removed by mechanical means. Mechanically prepare concrete substrate to obtain a surface profile of ± 1/8" (CSP 7-8 or greater as per ICRI Guidelines) with a new exposed aggregate surface. Area to be patched shall not be less than 1” in depth.
B. Where reinforcing steel with active corrosion is encountered, sandblast the steel to a white metal finish to remove all contaminants and rust. Where corrosion has occurred due to the presence of chlorides, the steel shall be high pressure washed after mechanical cleaning. Prime steel with 2 coats of Sika® Armatec® 110 EpoCem as per the Product Data Sheet.

3.2 MIXING AND APPLICATION

A. Start mixing with 5.5 pints of water. An additional 0.5 pint can be added if needed. Do not overwater, as excess water will cause segregation. Add entire contents of one bag of Sikacrete 211 SCC Plus while continuing to mix to a uniform consistency, maximum 3 minutes. Mechanically mix with a lowspeed (400-600 rpm) drill or in an appropriate-size mortar mixer or concrete mixer.

B. Placement Procedure: At the time of application, the substrate should be SSD (Saturated Surface Dry) with no standing water. Concrete must be scrubbed into substrate filling all pores and voids. While the scrub coat is still plastic, force material against edge of repair, working toward center. If repair area is too large to fill while scrub coat is still wet use Sika Armatec 110 EpoCem in lieu of scrub coat. After filling, consolidate, then screed. Allow concrete to set to desired stiffness, then finish with trowel, manual or power, for smooth surface. Broom or burlap drag for rough surface.

C. Alternatively the material may be poured or pumped into formed areas. To ensure proper filling and adhesion vibrate the material during placement or pump the repair material under pressure. Vibrate form while pouring or pumping. Pump with a variable pressure pump. Continue pumping until a 3 to 5 psi increase in normal line pressure is evident then STOP pumping. Form should not deflect. Vent to be capped when steady flow is evident, and forms stripped when appropriate.

D. As per ACI recommendations for portland cement concrete, curing is required. Moist cure with wet burlap and polyethylene, a fine mist of water or a water-based* compatible curing compound. Moist curing should commence immediately after finishing and continue for 48 hours. Protect newly applied material from rain, sun, and wind until compressive strength is 70% of the 28 day compressive strength. To prevent from freezing cover with insulating material. Setting time is dependent on temperature and humidity. Pretesting of curing compound.

E. Adhere to all procedures, limitations and cautions for the polymer-modified portland cement mortar in the manufacturers current printed Product Data Sheet (PDS) and literature.

END OF SECTION 033000
1.1 RELATED DOCUMENTS

A. This project may require extended work hours in order to meet the completion date. See Specification Section 00210 for Phasing and Schedule Requirements.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This procedure includes guidance on patching cracks in concrete by injecting an epoxy adhesive.

B. Epoxy Injection should be used for dormant cracks - cracks that remain unchanged. Dormant cracks generally pose little danger. However, if left unrepaired, they will provide channels for moisture penetration.

D. These guidelines should be reviewed prior to performing this procedure and should be followed, when applicable, along with recommendations from the Historic Preservation Officer.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM), 100 Barr Drive, West Conshohocken, PA 19428, (610) 832-9585 or FAX (610) 832-9555.

1.4 MANUFACTURERS

A. Abatron, Inc.
5501 95th Ave.
Kenosha, WI 53144
800/445-1754 or 414/653-2000

B. Sika Corporation
201 Polito Ave.
Lyndhurst, NJ 07071
201/933-8800

1.5 MATERIALS

A. Epoxy Resin (Abatron, Inc., Sika Corp.), or approved equal.
1. For Fine Cracks: (less than 1/8”)
   
   a. Epoxy shall be a two-part type, low viscosity epoxy adhesive material containing 100% solids and shall meet or exceed the following characteristics when tested in accordance with the standards specified.

   b. Characteristics of Components:
      
      1) Component A - shall be a blend of modified epoxy resins.
      2) Component B - shall be a blend of modified amine curing agents.

   c. Test Method Requirements:
      
      1) Component A - Brookfield RVT, 700 maximum; Viscosity @ 77 +/- 3 degrees F.,cps; Spindle No. 2 @ 20 rpm.
      2) Component B - Brookfield RVT, 240 maximum; Viscosity @ 77 +/- 3 degrees F., cps; Spindle No. 2.

   d. Properties of Combined Components: When mixed in the ratio of two parts Component A to one part Component B by volume; or 100 parts Component A to 44 parts Component B by weight, shall be:
      
      1) Potlife, 60g @ 77 +/- 3 degrees F., minutes; 25 minutes maximum.

   e. Properties of the Cured Adhesive: When cured for seven days @ 77 +/- 3 degrees F., unless otherwise specified, shall be:
      
      1) Ultimate Tensile Strength: ASTM D638; 8000 minimum.
      2) Compressive Yield Strength, psi: ASTM D695*; 15,000 minimum.

   NOTE: Test specimens must be cured in a manner such that the peak exothermic temperature of the adhesive does not exceed 77 degrees F.

2. For Wide Cracks:
   
   a. Epoxy shall be a two-part gel epoxy adhesive material containing 100% solids and shall meet or exceed the following characteristics when tested in accordance with the standards specified.

   b. Properties of Combined Components: When mixed in the ratio of two parts Component A to one part Component B by volume; or 100 parts Component A to 34 parts Component B by weight shall be:
      
      1) Potlife, 200g @ 77 degrees F. +/- 3 degrees F., minutes.
c. Properties of the Cured Adhesive: When cured for seven days @ 77 degrees F. +/- 3 degrees F., unless otherwise specified, shall be:

1) Ultimate Tensile Strength: ASTM D638; 1,500 psi minimum.
2) Compressive Yield Strength: ASTM D695; 6,000 psi minimum.

B. Surface Seal: (Epoxy Mortar or Oil-free Clay)

1. Description: The surface seal material is that material used to confine the injection adhesive in the joints or cracks during injection and cure.

2. Properties: The surface seal material shall have adequate strength to hold injection fittings firmly in place and to resist injection pressures adequately to prevent leakage during injection. The material shall not leave a residue upon removal.

NOTE: Provide adhesive crack fillers and other related materials that are compatible with one another and with substrates under conditions of severe weather, demonstrated by sealant manufacturer based on testing and field experience.

END OF SECTION
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. This project may require extended work hours in order to meet the completion date. See Specification Section 00210 for Phasing and Schedule Requirements.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.


1.2 SUMMARY

A. Section includes maintenance of unit masonry consisting of brick restoration and cleaning as follows:

1. Unused anchor removal.
2. Repairing unit masonry, including replacing units.
3. Painting steel uncovered during the work.
4. Re-anchoring veneers.
5. Repointing joints.
6. Preliminary cleaning, including removing plant growth.
7. Cleaning exposed unit masonry surfaces.

B. Related Sections:

1. Section 013591 "Historic Treatment Procedures."
2. Section 040140 "Maintenance of Stone Assemblies."
3. Section 042000 "Unit Masonry" for new clay masonry construction.
4. Section 076200 "Sheet Metal Flashing and Trim" for metal flashing installed in or on restored clay masonry.

1.3 ALLOWANCES

A. Allowances for clay masonry restoration and cleaning are specified in Section 012100 "Allowances."
1. Perform clay masonry restoration and cleaning work under quantity allowances and only as authorized. Authorized work includes work required by Drawings and the Specifications and work authorized in writing by Owner/Architect.

2. Notify Owner/Architect weekly of extent of work performed that is attributable to quantity allowances.

3. Perform work that exceeds quantity allowances only as authorized by Change Orders.

B. Remove and replace brick as part of brick removal and replacement shown on drawings.

C. Repoint masonry as part of repointing masonry shown on drawings.

1.4 UNIT PRICES

A. Work of this Section is affected by unit prices specified in Section 012200 "Unit Prices."

1. Unit prices apply to additions to and deletions from Work as authorized by Change Orders.

1.5 DEFINITIONS

A. Very Low-Pressure Spray: Under 100 psi.

B. Low-Pressure Spray: 100 to 400 psi; 4 to 6 gpm

C. Medium-Pressure Spray: 400 to 800 psi; 4 to 6 gpm.

D. High-Pressure Spray: 800 to 1200 psi; 4 to 6 gpm.

E. Saturation Coefficient: Ratio of the weight of water absorbed during immersion in cold water to weight absorbed during immersion in boiling water; used as an indication of resistance of masonry units to freezing and thawing.

1.6 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on masonry units as follows.

1. Provide test specimens as indicated and representative of proposed materials and construction.

2. Existing Brick and Terra Cotta: Test each type of existing masonry unit indicated for replacement, according to testing methods in ASTM C 67 for compressive strength, 24-hour cold-water absorption, 5-hour boil absorption, saturation coefficient, and initial rate of absorption (suction). Carefully remove five existing units from locations of repair and near repair. Take testing samples from these units.
3. Existing Mortar: Test according to ASTM C 295, modified as agreed by testing service and Architect for Project requirements, to determine proportional composition of original ingredients, sizes and colors of aggregates, and approximate strength. Use X-ray diffraction, infrared spectroscopy, and differential thermal analysis as necessary to supplement microscopical methods. Carefully remove existing mortar from within joints at 4 locations designated by Architect. Samples shall be taken from the original building brick (northeast 1930’s), the west addition (southwest 1950’s pool addition (with slate roof)), the 1930’s northeast limestone bay window, and one of the courtyards.

4. Temporary Patch: As directed by Architect, provide temporary materials at locations from which existing samples were taken.

5. Replacement Brick and Terra Cotta: Test each proposed type of replacement masonry unit, according to sampling and testing methods in ASTM C 67 for compressive strength, 24-hour cold-water absorption, 5-hour boil absorption, saturation coefficient, and initial rate of absorption (suction).

1.7 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include recommendations for application and use. Include test data substantiating that products comply with requirements.

B. Shop Drawings: For the following:

1. Provisions for expansion joints or other sealant joints.
2. Provisions for flashing, lighting fixtures, conduits, and weep holes as required.
3. Replacement and repair anchors. Include details of anchors within individual masonry units, with locations of anchors and dimensions of holes and recesses in units required for anchors.

C. Samples for Initial Selection: For the following:

1. Pointing Mortar: Submit sets of mortar for pointing in the form of sample mortar strips, 6 inches long by 1/2 inch wide, set in aluminum or plastic channels.
   a. Have each set contain a close color range of at least three samples of different mixes of colored sands and cements that produce a mortar matching the cleaned masonry when cured and dry.
   b. Submit with precise measurements on ingredients, proportions, gradations, and sources of colored sands from which each Sample was made.

2. Patching Compound: Submit sets of patching compound Samples in the form of plugs (patches in drilled holes) in sample units of masonry representative of the range of masonry colors on the building.
   a. Have each set contain a close color range of at least three samples of different mixes of patching compound that matches the variations in existing masonry when cured and dry.
4. Include similar Samples of accessories involving color selection.

D. Samples for Verification: For the following:

1. Each type of masonry unit to be used for replacing existing units. Include sets of Samples as necessary to show the full range of shape, color, and texture to be expected.
   a. For each brick type, provide straps or panels containing at least four bricks. Include multiple straps for brick with a wide range.

2. Each type, color, and texture of pointing mortar in the form of sample mortar strips, 6 inches long by 1/2 inch wide, set in aluminum or plastic channels.
   a. Include with each Sample a list of ingredients with proportions of each. Identify sources, both supplier and quarry, of each type of sand and brand names of cementitious materials and pigments if any.

3. Each type of masonry patching compound in the form of briquettes, at least 3 inches long by 1-1/2 inches wide. Document each Sample with manufacturer and stock number or other information necessary to order additional material.

4. Sealant Materials: See Section 079200 "Joint Sealants."
5. Accessories: Each type of anchor, accessory, and miscellaneous support.

1.8 INFORMATIONAL SUBMITTALS

A. Qualification Data: For restoration specialists including field supervisors and restoration worker, chemical-cleaner manufacturer and testing service.

B. Preconstruction Test Reports: For existing and replacement masonry units.

C. Quality-Control Program.

D. Restoration Program.

E. Cleaning Program.

1.9 QUALITY ASSURANCE

A. Restoration Specialist Qualifications: Engage an experienced masonry restoration and cleaning firm to perform work of this Section. Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience installing standard unit masonry is not sufficient experience for masonry restoration work.

1. At Contractor's option, work may be divided between two specialist firms: one for cleaning work and one for repair work.
2. Field Supervision: Restoration specialist firms shall maintain experienced full-time supervisors on Project site during times that clay masonry restoration and cleaning work is in progress. Supervisors shall not be changed during Project except for causes beyond the control of restoration specialist firm.

3. Restoration Worker Qualifications: Persons who are experienced and specialize in restoration work of types they will be performing. When masonry units are being patched, assign at least one worker among those performing patching work who is trained and certified by manufacturer of patching compound to apply its products.

B. Chemical-Cleaner Manufacturer Qualifications: A firm regularly engaged in producing masonry cleaners that have been used for similar applications with successful results, and with factory-trained representatives who are available for consultation and Project-site inspection and assistance at no additional cost.

C. Source Limitations: Obtain each type of material for masonry restoration (face brick, cement, sand, etc.) from one source with resources to provide materials of consistent quality in appearance and physical properties.

D. Quality-Control Program: Prepare a written quality-control program for this Project to systematically demonstrate the ability of personnel to properly follow methods and use materials and tools without damaging masonry. Include provisions for supervising performance and preventing damage due to worker fatigue.

E. Restoration Program: Prepare a written, detailed description of materials, methods, equipment, and sequence of operations to be used for each phase of restoration work including protection of surrounding materials and Project site.

1. Include methods for keeping pointing mortar damp during curing period.
2. If materials and methods other than those indicated are proposed for any phase of restoration work, add to the Quality-Control Program a written description of such materials and methods, including evidence of successful use on comparable projects, and demonstrations to show their effectiveness for this Project and worker's ability to use such materials and methods properly.

F. Cleaning Program: Prepare a written cleaning program that describes cleaning process in detail, including materials, methods, and equipment to be used, protection of surrounding materials, and control of runoff during operations.

1. If materials and methods other than those indicated are proposed for any phase of restoration work, add to the Quality-Control Program a written description of such materials and methods, including evidence of successful use on comparable projects, and demonstrations to show their effectiveness for this Project and worker's ability to use such materials and methods properly.

G. Cleaning and Repair Appearance Standard: Cleaned and repaired surfaces are to have a uniform appearance as viewed from 20 feet away by Architect. Perform additional paint and stain removal, general cleaning, and spot cleaning of small areas that are noticeably different, so that surface blends smoothly into surrounding areas.
H. Mockups: Prepare mockups of restoration and cleaning to demonstrate aesthetic effects and set quality standards for materials and execution and for fabrication and installation.

1. Masonry Repair: Prepare sample areas for each type of masonry material indicated to have repair work performed. If not otherwise indicated, size each mockup not smaller than 2 adjacent whole units or approximately 24 inches in least dimension. Erect sample areas in existing walls unless otherwise indicated, to demonstrate quality of materials, workmanship, and blending with existing work. Include the following as a minimum:
   a. Replacement:
      1) One brick unit replaced.
   b. Patching: Three small holes as directed for each type of masonry material indicated to be patched, so as to leave no evidence of repair.

2. Repointing: Rake out joints in 2 separate areas, each approximately 24 inches high by 24 inches wide for each type of repointing required and repoint one of the areas.

3. Cleaning: Clean an area approximately 25 sq. ft. for each type of masonry and surface condition.
   a. Test cleaners and methods on samples of adjacent materials for possible adverse reactions. Do not use cleaners and methods known to have deleterious effect.
   b. Allow a waiting period of not less than seven days after completion of sample cleaning to permit a study of sample panels for negative reactions.

4. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

5. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

I. Pre installation Conference: Conduct conference at Project site.

1. Review methods and procedures related to masonry restoration and cleaning including, but not limited to, the following:
   b. Materials, material application, sequencing, tolerances, and required clearances.
1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver masonry units to Project site strapped together in suitable packs or pallets or in heavy-duty cartons.

B. Deliver other materials to Project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of products.

C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

D. Store hydrated lime in manufacturer's original and unopened containers. Discard lime if containers have been damaged or have been opened for more than two days.

E. Store lime putty covered with water in sealed containers.

F. Store sand where grading and other required characteristics can be maintained and contamination avoided.

1.11 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit masonry restoration and cleaning work to be performed according to manufacturers' written instructions and specified requirements.

B. Repair masonry units and repoint mortar joints only when air temperature is between 40 and 90 deg F and is predicted to remain so for at least 7 days after completion of the Work unless otherwise indicated.

C. Cold-Weather Requirements: Comply with the following procedures for masonry repair and mortar-joint pointing unless otherwise indicated:

1. When air temperature is below 40 deg F, heat mortar ingredients, masonry repair materials, and existing masonry walls to produce temperatures between 40 and 120 deg F.
2. When mean daily air temperature is below 40 deg F, provide enclosure and heat to maintain temperatures above 32 deg F within the enclosure for 7 days after repair and pointing.

D. Hot-Weather Requirements: Protect masonry repair and mortar-joint pointing when temperature and humidity conditions produce excessive evaporation of water from mortar and repair materials. Provide artificial shade and wind breaks and use cooled materials as required to minimize evaporation. Do not apply mortar to substrates with temperatures of 90 deg F and above unless otherwise indicated.

E. For manufactured repair materials, perform work within the environmental limits set by each manufacturer.
F. Clean masonry surfaces only when air temperature is 40 deg F and above and is predicted to remain so for at least 7 days after completion of cleaning.

1.12 COORDINATION

A. Coordinate masonry restoration and cleaning with public circulation patterns at Project site. Some work is near public circulation patterns, active railroad tracks and existing overhead utilities. Public circulation patterns cannot be closed off entirely, and in places can be only temporarily redirected around small areas of work. Railroad traffic will not be stopped. Plan and execute the Work accordingly.

1.13 SEQUENCING AND SCHEDULING

A. Order replacement materials at earliest possible date to avoid delaying completion of the Work.

B. Order sand and portland cement for pointing mortar immediately after approval of mockups. Take delivery of and store at Project site a sufficient quantity to complete Project.

C. Perform masonry restoration work in the following sequence:

1. Remove plant growth.
2. Inspect for open mortar joints and repair before cleaning to prevent the intrusion of water and other cleaning materials into the wall.
3. Remove paint.
4. Clean masonry surfaces.
5. Where water repellents, specified in Section 071900 "Water Repellents," are to be used on or near masonry work, delay application of these chemicals until after pointing.
6. Rake out mortar from joints surrounding masonry to be replaced and from joints adjacent to masonry repairs along joints.
7. Repair masonry, including replacing existing masonry with new masonry materials.
8. Rake out mortar from joints to be repointed.
9. Point mortar and sealant joints.
10. After repairs and repointing have been completed and cured, perform a final cleaning to remove residues from this work.
11. Inspect for open mortar joints and repair before cleaning to prevent the intrusion of water and other cleaning materials into the wall.
12. Remove paint.
13. Clean masonry surfaces.

D. As scaffolding is removed, patch anchor holes used to attach scaffolding. Patch holes in masonry units to comply with "Masonry Unit Patching" Article. Patch holes in mortar joints to comply with "Repointing Masonry" Article.
PART 2 - PRODUCTS

2.1 MASONRY MATERIALS

A. Face Brick: Provide face brick, including specially molded, ground, cut, or sawed shapes where required to complete masonry restoration work.

1. Provide units with colors, color variation within units, surface texture, and physical properties to match Architect's sample. Match existing units in size and shape.
   a. For Architect's sample that exhibits a range of colors or color variation within units, provide brick that proportionally matches that range rather than brick that matches an individual color within that range.

2. Special Shapes:
   a. Provide specially molded, 100 percent solid shapes for applications where core holes or "frogs" could be exposed to view or weather when in final position and where shapes produced by sawing would result in sawed surfaces being exposed to view.
   b. Provide specially ground units, shaped to match patterns, for arches and where indicated.
   c. Mechanical chopping or breaking brick, or bonding pieces of brick together by adhesive, are not acceptable procedures for fabricating special shapes.

3. Tolerances as Fabricated: Comply with tolerance requirements in ASTM C 216, Type FBS
4. Date Identification: Emboss in the clay body on an interior surface of each unit in easily read 1/2-inch-high characters, Manufacturer's name may also be embossed.

B. Building Brick: Provide building brick complying with ASTM C 62, of same vertical dimension as face brick, for masonry work concealed from view.

1. Grade SW where in contact with earth.
2. Grade SW, MW, or NW for concealed backup.
3. Date Identification: Emboss in the clay body on an interior surface of each unit in easily read 1/2-inch-high characters, Manufacturer's name may also be embossed.

C. Salvaged Brick: Salvaged brick from location repair location and clean off residual mortar.

2.2 MORTAR MATERIALS

A. Portland Cement: ASTM C 150, Type I or Type II, white or gray or both where required for color matching of exposed mortar.
1. Provide cement containing not more than 0.60 percent total alkali when tested according to ASTM C 114.

B. Hydrated Lime: ASTM C 207, Type S.


D. Quicklime: ASTM C 5, pulverized lime.

E. Mortar Sand: ASTM C 144 unless otherwise indicated.
   1. Color: Provide natural sand or ground marble, granite, or other sound stone of color necessary to produce required mortar color.
   2. For pointing mortar, provide sand with rounded edges.
   3. Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands if necessary to achieve suitable match.

F. Mortar Pigments: Natural and synthetic iron oxides, compounded for mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortars.

G. Water: Potable.

2.3 MANUFACTURED REPAIR MATERIALS

A. Masonry Patching Compound: Factory-mixed cementitious product that is custom manufactured for patching masonry.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Cathedral Stone Products, Inc.; Jahn M100 Terra Cotta and Brick Repair Mortar.
      b. Conproco Corporation
      c. Edison Coatings, Inc.; Custom System 45.

   2. Use formulation that is vapor- and water permeable (equal to or more than the masonry unit), exhibits low shrinkage, has lower modulus of elasticity than the masonry units being repaired, and develops high bond strength to all types of masonry.
   3. Use formulation having working qualities and retardation control to permit forming and sculpturing where necessary.
   4. Formulate patching compound used for patching brick and terra cotta in colors and textures to match each masonry unit being patched. Provide sufficient number of colors to enable matching the color, texture, and variation of each unit.
2.4 PAINT REMOVERS

A. Alkaline Paste Paint Remover: Manufacturer's standard alkaline paste formulation for removing paint coatings from masonry.

1. **Products:** Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. ABR Products, Inc.; 800 Brush Grade.
   d. Price Research, Ltd.; Price Heavy Duty Paint Stripper.
   e. PROSOCO; Enviro Klean Safety Peel 2

B. Covered or Skin-Forming Alkaline Paint Remover: Manufacturer's standard covered or skin-forming alkaline formulation for removing paint coatings from masonry.

1. **Products:** Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. ABR Products, Inc.; Grip 'N Strip 800 Fast Acting.
   c. Dumond Chemicals, Inc.; Peel Away 1 System.
   d. PROSOCO; Enviro Klean Safety Peel 1

C. Solvent-Type Paint Remover: Manufacturer's standard water-rinsable, solvent-type gel formulation for removing paint coatings from masonry.

1. **Products:** Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. ABR Products, Inc.; Super Bio Strip Gel.
   b. Diedrich Technologies Inc.; 505 Special Coatings Stripper.
   c. Dumond Chemicals, Inc.; Peel Away 2.
   e. Price Research, Ltd.; Price Strip-All.
   f. PROSOCO; Sure Klean Fast Acting Stripper.

D. Low-Odor, Solvent-Type Paint Remover: Manufacturer's standard low-odor, water-rinsable solvent-type gel formulation, containing no methanol or methylene chloride, for removing paint coatings from masonry.
1. **Products:** Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. ABR Products, Inc.; Super Bio Strip Gel.
   b. Cathedral Stone Products, Inc.; S-Series
   c. Dumond Chemicals, Inc.; Peel Away
   d. PROSOCO; Enviro Klean Safety Peel

2.5 **CLEANING MATERIALS**

A. Water: Potable.

B. Hot Water: Water heated to a temperature of 140 to 160 deg F.

C. Job-Mixed Detergent Solution: Solution prepared by mixing 2 cups of tetrasodium polyphosphate, 1/2 cup of laundry detergent, and 20 quarts of hot water for every 5 gal. of solution required.

D. Job-Mixed Mold, Mildew, and Algae Remover: Solution prepared by mixing 2 cups of tetrasodium polyphosphate, 5 quarts of 5 percent sodium hypochlorite (bleach), and 15 quarts of hot water for every 5 gal. of solution required.

E. Nonacidic Gel Cleaner: Manufacturer's standard gel formulation, with pH between 6 and 9, that contains detergents with chelating agents and is specifically formulated for cleaning masonry surfaces.

   1. **Products:** Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Price Research, Ltd.; Price Marble Cleaner-Gel.
      b. PROSOCO; Sure Klean 942 Limestone and Marble Cleaner.

F. Nonacidic Liquid Cleaner: Manufacturer's standard mildly alkaline liquid cleaner formulated for removing mold, mildew, and other organic soiling from ordinary building materials, including polished stone, brick, aluminum, plastics, and wood.

   1. **Products:** Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Diedrich Technologies Inc.; Diedrich 910PM Polished Marble Cleaner.
      c. Dumond Chemicals, Inc.; Safe n' Easy Architectural Cleaner/Restorer.
      d. Price Research, Ltd.; Price Non-Acid Masonry Cleaner.
      e. PROSOCON; Enviro Klean 2010 All Surface Cleaner.
G. Mild Acidic Cleaner: Manufacturer's standard mildly acidic cleaner containing no muriatic (hydrochloric), hydrofluoric, or sulfuric acid; or ammonium bifluoride or chlorine bleaches.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. ABR Products, Inc.; X-190 Limestone & Concrete Cleaner.
   b. Diedrich Technologies Inc.; Envirorestore 100.
   c. Dominion Restoration Products, Inc.; DR-60 Stone and Masonry Cleaner.
   d. PROSOCO; Enviro Klean BioWash.

H. Acidic Cleaner: Manufacturer’s standard acidic masonry cleaner composed of hydrofluoric acid or ammonium bifluoride blended with other acids, detergents, wetting agents, and inhibitors.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. ABR Products, Inc.; 801 Heavy Duty Masonry Cleaner.
   b. Diedrich Technologies Inc.; 101G Granite, Terra Cotta, and Brick Cleaner.
   c. Dumond Chemicals, Inc.; Safe n’ Easy Ultimate Stone and Masonry Cleaner
   d. EaCo Chem, Inc.; GS-Restoration
   e. Hydroclean, Hydrochemical Techniques, Inc.; Hydroclean Brick, Granite, Sandstone and Terra Cotta Cleaner (HT-626).
   f. Price Research, Ltd.; Price Restoration Cleaner.
   g. PROSOCO; Enviro Klean Restoration Cleaner

I. Two-Part Chemical Cleaner: Manufacturer's standard system consisting of potassium or sodium hydroxide based, alkaline prewash cleaner and acidic after wash cleaner that does not contain hydrofluoric acid.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. ABR Products, Inc.; 500 Limestone Prewash Cleaner followed by 500 Limestone Afterwash.
   b. Diedrich Technologies Inc.; Diedrich 808 Limestone Pre-Wash followed by 707N Limestone Neutralizer After-Rinse.
   c. PROSOCO; Enviro Klean BioKlean followed by Sure Klean Limestone & Masonry Afterwash
2.6 ACCESSORY MATERIALS

A. Liquid Strippable Masking Agent: Manufacturer's standard liquid, film-forming, strippable masking material for protecting glass, metal, and polished stone surfaces from damaging effects of acidic and alkaline masonry cleaners.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. ABR Products, Inc.; Rubber Mask.
   b. Price Research, Ltd.; Price Mask.
   c. PROSOCO; Sure Klean Strippable Masking.

B. Masonry Repair Anchors, Expansion Type: Mechanical fasteners designed for masonry veneer stabilization consisting of 1/4-inch diameter, Type 316 stainless-steel rod with brass expanding shells at each end and water-shedding washer in the middle. Expanding shells shall be designed to provide positive mechanical anchorage to veneer on one end and backup masonry on the other.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. BLOK-LOK Limited; Torg-Lok.
   b. Dur-O-Wal, a division of Dayton Superior; Dur-O-Wal Repair Anchor.
   c. Hohmann & Barnard, Inc.; #521RA-B Restoration Anchor.

C. Masonry Repair Anchors, Spiral Type: Type 316 stainless-steel spiral rods designed to anchor to backing and veneer. Anchors are flexible in plane of veneer but rigid perpendicular to it.

1. Provide adhesive-installed anchors complete with manufacturer's standard epoxy adhesive and injection tubes, or other devices required for installation.
2. Provide driven-in anchors designed to be installed in drilled holes and relying on screw effect rather than adhesive to secure them to backup and veneer.
3. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. BLOK-LOK Limited; Spira-Lok.
   b. Dur-O-Wal, a division of Dayton Superior; Dur-O-Pair Resin Anchor.
   c. Heckmann Building Products Inc.; #391 Remedial Tie.
   d. Hohmann & Barnard, Inc.; Helix Spiro-Ties.

D. Masonry Repair Anchors, Rod/Screen Tube Type: Stainless-steel screen tube with or without Type 316 stainless-steel rod, adhesive installed by injection with manufacturer's standard epoxy adhesive, complete with other devices required for installation.
1. **Products:** Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. BLOK-LOK Limited; Chem-Lok.
   b. Hohmann & Barnard, Inc.; #520RA.

E. **Sealant Materials:**

1. Provide manufacturer's standard chemically curing, elastomeric sealant(s) of base polymer and characteristics indicated below that comply with applicable requirements in Section 079200 "Joint Sealants."

   a. **Single-component, nonsag urethane sealant**

2. Colors: Provide colors of exposed sealants to match colors of masonry adjoining installed sealant unless otherwise indicated.

3. Ground-Mortar Aggregate: Custom crushed and ground pointing mortar sand or existing mortar retrieved from joints. Grind to a particle size that matches the adjacent mortar aggregate and color. Remove all fines passing the 100 sieve.

F. **Joint-Sealant Backing:**

1. Cylindrical Sealant Backings: ASTM C 1330, **Type C (closed-cell material with a surface skin)**, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

2. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where acceptable.

G. **Setting Buttons:** Resilient plastic buttons, nonstaining to masonry, sized to suit joint thicknesses and bed depths of masonry units without intruding into required depths of pointing materials.

H. **Masking Tape:** Nonstaining, nonabsorbent material, compatible with pointing mortar, joint primers, sealants, and surfaces adjacent to joints; that will easily come off entirely, including adhesive.

I. **Antirust Coating:** Fast-curing, lead- and chromate-free, self-curing, universal modified-alkyd primer complying with MPI #79, Alkyd Anticorrosive Metal Primer or SSPC-Paint 20 or SSPC-Paint 29 zinc-rich coating.

   1. Use coating requiring no better than SSPC-SP 2, "Hand Tool Cleaning" surface preparation according to manufacturer's literature or certified statement.

J. **Miscellaneous Products:** Select materials and methods of use based on the following, subject to approval of a mockup:

   1. Previous effectiveness in performing the work involved.
2. Little possibility of damaging exposed surfaces.
3. Consistency of each application.
4. Uniformity of the resulting overall appearance.
5. Do not use products or tools that could do the following:
   a. Remove, alter, or in any way harm the present condition or future preservation of existing surfaces, including surrounding surfaces not in contract.
   b. Leave a residue on surfaces.

2.7 MORTAR MIXES

A. Preparing Lime Putty: Slake quicklime and prepare lime putty according to appendix to ASTM C 5 and manufacturer's written instructions.

B. Measurement and Mixing: Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.

1. Mixing Pointing Mortar: Thoroughly mix cementitious materials and sand together before adding any water. Then mix again adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for 15 to 30 minutes. Add remaining water in small portions until mortar reaches desired consistency. Use mortar within one hour of final mixing; do not re-temper or use partially hardened material.

C. Colored Mortar: Produce mortar of color required by using specified ingredients. Do not alter specified proportions without Architect's approval.

1. Mortar Pigments: Where mortar pigments are indicated, do not exceed a pigment-to-cement ratio of 1:10 by weight.

D. Do not use admixtures in mortar unless otherwise indicated.

E. Mortar Proportions: Mix mortar materials in the following proportions:

1. As determined from laboratory testing.
   a. Add mortar pigments to produce mortar colors required.

2.8 CHEMICAL CLEANING SOLUTIONS

A. Dilute chemical cleaners with water to produce solutions not exceeding concentration recommended by chemical-cleaner manufacturer.
B. Acidic Cleaner Solution for **Brick and Brownstone Terra Cotta**: Dilute with water to produce hydrofluoric acid content of 3 percent or less, but not greater than that recommended by chemical-cleaner manufacturer.

C. Acidic Cleaner Solution for **Glazed Terra Cotta**: Dilute with water to concentration demonstrated by testing that does not etch or otherwise damage terra cotta surface, but not greater than that recommended by chemical-cleaner manufacturer.

**PART 3 - EXECUTION**

3.1 PROTECTION

A. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from masonry restoration work.

1. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during course of restoration and cleaning work.

B. Comply with chemical-cleaner manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products. Prevent chemical-cleaning solutions from coming into contact with people, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.

1. Cover adjacent surfaces with materials that are proven to resist chemical cleaners used unless chemical cleaners being used will not damage adjacent surfaces. Use materials that contain only waterproof, UV-resistant adhesives. Apply masking agents to comply with manufacturer's written instructions. Do not apply liquid masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining.

2. Keep wall wet below area being cleaned to prevent streaking from runoff.

3. Do not clean masonry during winds of sufficient force to spread cleaning solutions to unprotected surfaces.

4. Neutralize and collect alkaline and acid wastes for disposal off Owner's property.

5. Dispose of runoff from cleaning operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.

C. Prevent mortar from staining face of surrounding masonry and other surfaces.

1. Cover sills, ledges, and projections to protect from mortar droppings.

2. Keep wall area wet below rebuilding and pointing work to discourage mortar from adhering.

3. Immediately remove mortar in contact with exposed masonry and other surfaces.

4. Clean mortar splatters from scaffolding at end of each day.
D. Remove gutters and downspouts adjacent to masonry and store where indicated during masonry restoration and cleaning. Reinstall when masonry restoration and cleaning are complete.

1. Provide temporary rain drainage during work as indicated to direct water away from building.

3.2 UNUSED ANCHOR REMOVAL

A. Remove masonry anchors, brackets, wood nailers, and other extraneous items no longer in use unless identified as historically significant or indicated to remain.

1. Remove items carefully to avoid spalling or cracking masonry.
2. Where directed, if an item cannot be removed without damaging surrounding masonry, do the following:
   a. Cut or grind off item approximately 3/4 inch beneath surface and core drill a recess of same depth in surrounding masonry as close around item as practical.
   b. Immediately paint exposed end of item with two coats of antirust coating, following coating manufacturer's written instructions and without exceeding manufacturer's recommended dry film thickness per coat. Keep paint off sides of recess.
3. Patch the hole where each item was removed unless directed to remove and replace the masonry unit.

3.3 BRICK REMOVAL AND REPLACEMENT

A. At locations indicated, remove bricks that are damaged, spalled, or deteriorated or are to be reused. Carefully demolish or remove entire units from joint to joint, without damaging surrounding masonry, in a manner that permits replacement with full-size units.

1. When removing single bricks, remove material from center of brick and work toward outside edges.

B. Support and protect remaining masonry that surrounds removal area. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition.

C. Notify Architect of unforeseen detrimental conditions including voids, cracks, bulges, and loose units in existing masonry backup, rotted wood, rusted metal, and other deteriorated items.

D. Remove in an undamaged condition as many whole bricks as possible.

1. Remove mortar, loose particles, and soil from brick by cleaning with hand chisels, brushes, and water.
2. Remove sealants by cutting close to brick with utility knife and cleaning with solvents.
3. Store brick for reuse. Store off ground, on skids, and protected from weather.
4. Deliver cleaned brick not required for reuse to Owner unless otherwise indicated.

E. Clean bricks surrounding removal areas by removing mortar, dust, and loose particles in preparation for replacement.

F. Replace removed damaged brick with other removed brick and salvaged brick in good quality, where possible, or with new brick matching existing brick, including size. Do not use broken units unless they can be cut to usable size.

G. Install replacement brick into bonding and coursing pattern of existing brick. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.

1. Maintain joint width for replacement units to match existing joints.
2. Use setting buttons or shims to set units accurately spaced with uniform joints.

H. Lay replacement brick with completely filled bed, head, and collar joints. Butter ends with sufficient mortar to fill head joints and shove into place. Wet both replacement and surrounding bricks that have ASTM C 67 initial rates of absorption (suction) of more than 30 g/30 sq. in. per min. Use wetting methods that ensure that units are nearly saturated but surface is dry when laid.

1. Tool exposed mortar joints in repaired areas to match joints of surrounding existing brickwork.
2. Rake out mortar used for laying brick before mortar sets and point new mortar joints in repaired area to comply with requirements for repointing existing masonry, and at same time as repointing of surrounding area.
3. When mortar is sufficiently hard to support units, remove shims and other devices interfering with pointing of joints.

3.4 TERRA COTTA REMOVAL AND REPLACEMENT

A. At locations indicated, remove terra cotta units that are damaged, spalled, or deteriorated. Carefully demolish or remove entire units from joint to joint, without damaging surrounding masonry, in a manner that permits replacement with full-size units.

B. Support and protect remaining masonry that was supported by removed units. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition.

C. Notify Architect of unforeseen detrimental conditions including voids, cracks, bulges, and loose units in existing masonry backup, rotted wood, rusted metal, and other deteriorated items.
D. Clean masonry surrounding removal areas by removing mortar, dust, and loose particles in preparation for replacement.

E. Install replacement units into bonding and coursing pattern of existing units.
   1. Do not cut or grind glazed terra cotta.
   2. If minor cutting of replacement brownstone terra cotta is required, use a motor-driven grinder or saw designed to cut masonry with clean, sharp, unchipped edges. Do not cut or grind more than $\frac{1}{8}$ inch along any edge.
   3. Use setting buttons or shims to set units accurately spaced with uniform joints.

F. Set replacement units in a full bed of mortar. Replace existing anchors with new anchors of size and type indicated.
   1. Embed anchors in mortar and fill voids behind units with mortar.
   2. Tool exposed mortar joints in repaired areas to match joints of surrounding existing terra cotta.
   3. Rake out mortar used for laying terra cotta before mortar sets and point new mortar joints in repaired area to comply with requirements for repointing existing masonry, and at same time as repointing of surrounding area.
   4. When mortar is sufficiently hard to support units, remove shims and other devices interfering with pointing of joints.

3.5 REANCHORING VENEERS

A. Install masonry repair anchors in horizontal mortar joints and according to manufacturer's written instructions. Install at not more than 16 inches o.c. vertically and 32 inches o.c. horizontally unless otherwise indicated. Install at locations to avoid penetrating flashing.

B. Recess anchors at least 5/8 inch from surface of mortar joint and fill recess with pointing mortar.

3.6 PAINTING STEEL UNCOVERED DURING THE WORK

A. Inspect steel exposed during masonry removal. Where Architect determines that it is structural, or for other reasons cannot be totally removed, prepare and paint it as follows:
   1. Remove paint, rust, and other contaminants according to SSPC-SP 3, "Power Tool Cleaning", as applicable to meet paint manufacturer's recommended preparation.
   2. Immediately paint exposed steel with two coats of antirust coating, following coating manufacturer's written instructions and without exceeding manufacturer's recommended rate of application (dry film thickness per coat).

B. If on inspection and rust removal, the cross section of a steel member is found to be reduced from rust by more than $\frac{1}{16}$ inch, notify Architect before proceeding.
3.7 MASONRY UNIT PATCHING

A. Patch the following masonry units unless another type of replacement or repair is indicated:

1. Units indicated to be patched.
2. Units with holes.
3. Units with chipped edges or corners.
4. Units with small areas of deep deterioration.

B. Remove and replace existing patches unless otherwise indicated or approved by Architect.

C. Patching Bricks:

1. Remove loose material from masonry surface. Carefully remove additional material so patch will not have feathered edges but will have square or slightly undercut edges on area to be patched and will be at least 1/4 inch thick, but not less than recommended by patching compound manufacturer.
2. Mask adjacent mortar joint or rake out for repointing if patch will extend to edge of masonry unit.
3. Mix patching compound in individual batches to match each unit being patched. Combine one or more colors of patching compound, as needed, to produce exact match.
4. Rinse surface to be patched and leave damp, but without standing water.
5. Brush-coat surfaces with slurry coat of patching compound according to manufacturer's written instructions.
6. Place patching compound in layers as recommended by patching compound manufacturer, but not less than 1/4 inch or more than 2 inches thick. Roughen surface of each layer to provide a key for next layer.
7. Trowel, scrape, or carve surface of patch to match texture and surrounding surface plane or contour of the masonry unit. Shape and finish surface before or after curing, as determined by testing, to best match existing masonry unit.
8. Keep each layer damp for 72 hours or until patching compound has set.

D. Patching Terra Cotta:

1. Remove deteriorated material as determined by sounding gently with a small hammer. Carefully remove additional material so patch will not have feathered edges but will have square or slightly undercut edges on area to be patched and will be at least 1/4 inch thick, but not less than recommended by patching compound manufacturer.
2. Where mortar joints adjacent to patch are open, fill back of joints with pointing mortar and allow to cure before patching terra cotta. Leave space for pointing joints according to "Repointing Masonry" Article.
3. Mask adjacent mortar joint or rake out for repointing if patch will extend to edge of unit.
4. Rinse surface to be patched and leave damp, but without standing water.
5. Brush-coat surfaces with slurry coat of patching compound according to manufacturer's written instructions.
6. Place patching compound in layers as recommended by patching compound manufacturer, but not less than 1/4 inch or more than 2 inches thick. Roughen surface of each layer to provide a key for next layer.

7. Do not apply patching compound over mortar joints. If patching compound bridges mortar joints, cut out joints after patching compound hardens.

8. Trowel, scrape, or carve surface of patch to match texture, details, and surrounding surface plane or contour of terra cotta. Shape and finish surface before or after curing, as determined by testing to best match existing terra cotta.

9. Keep each layer damp for 72 hours or until patching compound has set.

10. After final layer of patching compound has cured, apply glaze replacement according to manufacturer's written instructions. Apply two or more coats, as needed, to match glaze of adjacent terra cotta units.

3.8 WIDENING JOINTS

A. Do not widen a joint, except where indicated or approved by Architect.

B. Location Guideline: Where an existing masonry unit abuts another or the joint is less than 1/8 inch, widen the joint for length indicated and to depth required for repointing after obtaining Architect's approval.

C. Carefully perform widening by cutting, grinding, routing, or filing procedures demonstrated in an approved mockup.

D. Widen joint to width equal to or less than predominant width of other joints on building. Make sides of widened joint uniform and parallel. Ensure that edges of units along widened joint are in alignment with joint edges at unaltered joints.

3.9 CLEANING MASONRY, GENERAL

A. Proceed with cleaning in an orderly manner; work from top to bottom of each scaffold width and from one end of each elevation to the other. Ensure that dirty residues and rinse water will not wash over cleaned, dry surfaces.

B. Use only those cleaning methods indicated for each masonry material and location.

1. Do not use wire brushes or brushes that are not resistant to chemical cleaner being used. Do not use plastic-bristle brushes if natural-fiber brushes will resist chemical cleaner being used.

2. Use spray equipment that provides controlled application at volume and pressure indicated, measured at spray tip. Adjust pressure and volume to ensure that cleaning methods do not damage masonry.

   a. Equip units with pressure gages.

3. For chemical-cleaner spray application, use low-pressure tank or chemical pump suitable for chemical cleaner indicated, equipped with cone-shaped spray tip.
4. For water-spray application, use fan-shaped spray tip that disperses water at an angle of 25 to 50 degrees.
5. For high-pressure water-spray application, use fan-shaped spray tip that disperses water at an angle of at least 40 degrees.
6. For heated water-spray application, use equipment capable of maintaining temperature between 140 and 160 deg F at flow rates indicated.
7. For steam application, use steam generator capable of delivering live steam at nozzle.

C. Perform each cleaning method indicated in a manner that results in uniform coverage of all surfaces, including corners, moldings, and interstices, and that produces an even effect without streaking or damaging masonry surfaces.

D. Water Application Methods:

1. Water-Soak Application: Soak masonry surfaces by applying water continuously and uniformly to limited area for time indicated. Apply water at low pressures and low volumes in multiple fine sprays using perforated hoses or multiple spray nozzles. Erect a protective enclosure constructed of polyethylene sheeting to cover area being sprayed.

2. Water-Spray Applications: Unless otherwise indicated, hold spray nozzle at least 6 inches from surface of masonry and apply water in horizontal back and forth sweeping motion, overlapping previous strokes to produce uniform coverage.

E. Steam Cleaning: Apply steam to masonry surfaces at the very low pressures indicated for each type of masonry material. Hold nozzle at least 6 inches from surface of masonry and apply steam in horizontal back and forth sweeping motion, overlapping previous strokes to produce uniform coverage.

F. Chemical-Cleaner Application Methods: Apply chemical cleaners to masonry surfaces to comply with chemical-cleaner manufacturer’s written instructions; use brush or spray application. Do not spray apply at pressures exceeding 50 psi. Do not allow chemicals to remain on surface for periods longer than those indicated or recommended by manufacturer.

G. Rinse off chemical residue and soil by working upward from bottom to top of each treated area at each stage or scaffold setting. Periodically during each rinse, test pH of rinse water running off of cleaned area to determine that chemical cleaner is completely removed.

1. Apply neutralizing agent and repeat rinse if necessary to produce tested pH of between 6.7 and 7.5.

H. After cleaning is complete, remove protection no longer required. Remove tape and adhesive marks.
3.10 PRELIMINARY CLEANING

A. Removing Plant Growth: Completely remove visible plant, moss, and shrub growth from masonry surfaces. Carefully remove plants, creepers, and vegetation by cutting at roots and allowing to dry as long as possible before removal. Remove loose soil and debris from open masonry joints to whatever depth they occur.

B. Preliminary Cleaning: Before beginning general cleaning, remove extraneous substances that are resistant to cleaning methods being used. Extraneous substances include paint, calking, asphalt, and tar.

   1. Carefully remove heavy accumulations of material from surface of masonry with a sharp chisel. Do not scratch or chip masonry surface.
   2. Remove paint and calking with alkaline paint remover.
      b. Repeat application up to two times if needed.
   3. Remove asphalt and tar with solvent-type paint remover.
      b. Apply paint remover only to asphalt and tar by brush without pre-wetting.
      c. Allow paint remover to remain on surface for 10 to 30 minutes.
      d. Repeat application if needed.

3.11 PAINT REMOVAL

A. Paint Removal with Alkaline Paste Paint Remover: (reserved if needed)

   1. Remove loose and peeling paint using [low] [medium] [high]-pressure spray, scrapers, stiff brushes, or a combination of these. Let surface dry thoroughly.
   2. Apply paint remover to dry, painted masonry with brushes.
   3. Allow paint remover to remain on surface for period recommended by manufacturer.
   4. Rinse with [cold] [hot] water applied by [low] [medium] [high]-pressure spray to remove chemicals and paint residue.
   5. Repeat process if necessary to remove all paint.
   6. Apply acidic cleaner or manufacturer’s recommended after wash to masonry, while surface is still wet, using low-pressure spray equipment or soft-fiber brush. Let cleaner or after wash remain on surface as a neutralizing agent for period recommended by chemical cleaner or after wash manufacturer.
   7. Rinse with cold water applied by [low] [medium] [high]-pressure spray to remove chemicals and soil.

B. Paint Removal with Covered or Skin-Forming Alkaline Paint Remover:

   1. Remove loose and peeling paint using [low] [medium] [high]-pressure spray, scrapers, stiff brushes, or a combination of these. Let surface dry thoroughly.
2. Apply paint remover to dry, painted masonry with trowel, spatula, or as recommended by manufacturer.
3. Apply cover, if required by manufacturer, per manufacturer's written instructions.
4. Allow paint remover to remain on surface for period recommended by manufacturer or as determined in test panels.
5. Scrape off paint and remover and collect for disposal.
6. Rinse with \textbf{[cold]} \textbf{[hot]} water applied by \textbf{[low]} \textbf{[medium]} \textbf{[high]}-pressure spray to remove chemicals and paint residue.
7. Use alkaline paste paint remover, according to "Paint Removal with Alkaline Paste Paint Remover" Paragraph, if necessary to remove remaining paint.
8. Apply acidic cleaner or manufacturer's recommended after wash to masonry, while surface is still wet, using low-pressure spray equipment or soft-fiber brush. Let cleaner or after wash remain on surface as a neutralizing agent for period recommended by chemical-cleaner or afterwash manufacturer.
9. Rinse with cold water applied by \textbf{[low]} \textbf{[medium]} \textbf{[high]}-pressure spray to remove chemicals and soil.

C. Paint Removal with Solvent-Type Paint Remover:

1. Remove loose and peeling paint using \textbf{[low]} \textbf{[medium]} \textbf{[high]}-pressure spray, scrapers, stiff brushes, or a combination of these. Let surface dry thoroughly.
2. Apply thick coating of paint remover to painted masonry with natural-fiber cleaning brush, deep-nap roller, or large paint brush.
3. Allow paint remover to remain on surface for period recommended by manufacturer. \textbf{Agitate periodically with stiff-fiber brush}.
4. Rinse with \textbf{[cold]} \textbf{[hot]} water applied by \textbf{[low]} \textbf{[medium]} \textbf{[high]}-pressure spray to remove chemicals and paint residue.

3.12 CLEANING BRICKWORK

A. Cold-Water Soak:

1. Apply cold water by intermittent spraying to keep surface moist.
2. Use perforated hoses or other means that will apply a fine water mist to entire surface being cleaned.
3. Apply water in cycles with at least 30 minutes between cycles.
4. Continue spraying until surface encrustation has softened sufficiently to permit its removal by water wash, as indicated by cleaning tests.
5. Continue spraying for 72 hours.
6. Remove soil and softened surface encrustation from masonry with cold water applied by low-pressure spray.

B. Cold-Water Wash: Use cold water applied by \textbf{low} pressure spray.

C. Hot-Water Wash: Use hot water applied by \textbf{low} pressure spray.

D. Steam Cleaning: Apply steam at very low pressures not exceeding 30 psi Remove dirt softened by steam with wood scrapers, stiff-nylon or -fiber brushes, or cold-water wash, as indicated by cleaning tests.
E. Detergent Cleaning:

1. Wet masonry with cold water applied by low-pressure spray.
2. Scrub masonry with detergent solution using medium-soft brushes until soil is thoroughly dislodged and can be removed by rinsing. Use small brushes to remove soil from mortar joints and crevices. Dip brush in solution often to ensure that adequate fresh detergent is used and that masonry surface remains wet.
3. Rinse with cold water applied by low pressure spray to remove detergent solution and soil.
4. Repeat cleaning procedure above where required to produce cleaning effect established by mockup.

F. Mold, Mildew, and Algae Removal:

1. Wet masonry with cold water applied by low-pressure spray.
2. Apply mold, mildew, and algae remover by brush or low-pressure spray.
3. Scrub masonry with medium-soft brushes until mold, mildew, and algae are thoroughly dislodged and can be removed by rinsing. Use small brushes for mortar joints and crevices. Dip brush in mold, mildew, and algae remover often to ensure that adequate fresh cleaner is used and that masonry surface remains wet.
4. Rinse with cold water applied by medium pressure spray to remove mold, mildew, and algae remover and soil.
5. Repeat cleaning procedure above where required to produce cleaning effect established by mockup.

G. Nonacidic Gel Chemical Cleaning:

1. Wet masonry with cold water applied by low-pressure spray.
2. Apply nonacidic gel cleaner in 1/8-inch thickness by brush, working into joints and crevices. Apply quickly and do not brush out excessively so area will be uniformly covered with fresh cleaner and dwell time will be uniform throughout area being cleaned.
3. Let cleaner remain on surface for period indicated below:
   a. As recommended by chemical-cleaner manufacturer.
   b. As established by mockup.
4. Remove bulk of nonacidic gel cleaner by squeegeeing into containers for disposal.
5. Rinse with cold water applied by low-pressure spray to remove chemicals and soil.
6. Repeat cleaning procedure above where required to produce cleaning effect established by mockup. Do not repeat more than once. If additional cleaning is required, use steam cleaning.

H. Nonacidic Liquid Chemical Cleaning:

1. Wet masonry with cold water applied by low-pressure spray.
2. Apply cleaner to masonry in **two applications** by brush or **low-pressure spray**. Let cleaner remain on surface for period indicated below:

   a. As recommended by chemical-cleaner manufacturer.
   b. As established by mockup.
   c. Two to three minutes.

3. Rinse with **cold** water applied by **low** pressure spray to remove chemicals and soil.

4. Repeat cleaning procedure above where required to produce cleaning effect established by mockup. Do not repeat more than once. If additional cleaning is required, use steam cleaning.

I. **Mild Acidic** Chemical Cleaning:

1. Wet masonry with cold water applied by low-pressure spray.
2. Apply cleaner to masonry in **two applications** by brush or **low-pressure spray**. Let cleaner remain on surface for period indicated below:

   a. As recommended by chemical-cleaner manufacturer.
   b. As established by mockup.
   c. Two to three minutes.

3. Rinse with cold water applied by **low** pressure spray to remove chemicals and soil.

4. Repeat cleaning procedure above where required to produce cleaning effect established by mockup. Do not repeat more than once. If additional cleaning is required, use a steam cleaning.

3.13 **REPOINTING MASONRY**

A. Rake out and repoint joints to the following extent:

1. All joints in areas indicated.
2. Joints where mortar is missing or where they contain holes.
3. Cracked joints where cracks can be penetrated at least 1/4 inch by a knife blade 0.027 inch thick.
4. Cracked joints where cracks are 1/8 inch or more in width and of any depth.
5. Joints where they sound hollow when tapped by metal object.
6. Joints where they are worn back 1/4 inch or more from surface.
7. Joints where they are deteriorated to point that mortar can be easily removed by hand, without tools.
8. Joints where they have been filled with substances other than mortar.
9. Joints indicated as sealant-filled joints.

B. Do not rake out and repoint joints where not required.

C. Rake out joints as follows, according to procedures demonstrated in approved mockup:
1. Remove mortar from joints to depth of **2 times joint width** but not less than 1/2 inch or not less than that required to expose sound, un-weathered mortar.

2. Remove mortar from masonry surfaces within raked-out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum, or flush joints to remove dirt and loose debris.

3. Do not spall edges of masonry units or widen joints. Replace or patch damaged masonry units as directed by Architect.
   a. Cut out mortar by hand with chisel and resilient mallet. Do not use power-operated grinders without Architect's written approval based on approved quality-control program.
   b. Cut out center of mortar bed joints using angle grinders with diamond-impregnated metal blades. Remove remaining mortar by hand with chisel and resilient mallet. Strictly adhere to approved quality-control program.

D. Notify Architect of unforeseen detrimental conditions including voids in mortar joints, cracks, loose masonry units, rotted wood, rusted metal, and other deteriorated items.

E. Pointing with Mortar:
   1. Rinse joint surfaces with water to remove dust and mortar particles. Time rinsing application so, at time of pointing, joint surfaces are damp but free of standing water. If rinse water dries, dampen joint surfaces before pointing.
   2. Apply pointing mortar first to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8 inch until a uniform depth is formed. Fully compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.
   3. After low areas have been filled to same depth as remaining joints, point all joints by placing mortar in layers not greater than 3/8 inch. Fully compact each layer and allow to become thumbprint hard before applying next layer. Where existing masonry units have worn or rounded edges, slightly recess finished mortar surface below face of masonry to avoid widened joint faces. Take care not to spread mortar beyond joint edges onto exposed masonry surfaces or to featheredge the mortar.
   4. When mortar is thumbprint hard, tool joints to match original appearance of joints as demonstrated in approved mockup. Remove excess mortar from edge of joint by brushing.
   5. Cure mortar by maintaining in thoroughly damp condition for at least 72 consecutive hours including weekends and holidays.
      a. Acceptable curing methods include covering with wet burlap and plastic sheeting, periodic hand misting, and periodic mist spraying using system of pipes, mist heads, and timers.
      b. Adjust curing methods to ensure that pointing mortar is damp throughout its depth without eroding surface mortar.
   6. Hairline cracking within the mortar or mortar separation at edge of a joint is unacceptable. Completely remove such mortar and repoint.

F. Pointing with Sealant:
1. After raking out, keep joints dry and free of mortar and debris.
2. Clean and prepare joint surfaces according to Section 079200 "Joint Sealants." **Prime joint surfaces unless sealant manufacturer recommends against priming.** Do not allow primer to spill or migrate onto adjoining surfaces.
3. Fill sealant joints with specified joint sealant according to Section 079200 "Joint Sealants" and the following:
   a. Install cylindrical sealant backing beneath the sealant, except where space is insufficient. There, install bond-breaker tape.
   b. Install sealant using only proven installation techniques that will ensure that sealant will be deposited in a uniform, continuous ribbon, without gaps or air pockets, and with complete wetting of the joint bond surfaces equally on both sides. Fill joint flush with surrounding masonry and matching the contour of adjoining mortar joints.
   c. Install sealant as recommended by sealant manufacturer but within the following general limitations, measured at the center (thin) section of the bead:
      1) Fill joints to a depth equal to joint width, but not more than 1/2 inch deep or less than 1/4 inch deep.
   d. Immediately after first tooling, apply ground-mortar aggregate to sealant, gently pushing aggregate into the surface of sealant. Retool sealant to form smooth, uniform beads, slightly concave. Remove excess sealant and aggregate from surfaces adjacent to joint.
   e. Do not allow sealant to overflow or spill onto adjoining surfaces, or to migrate into the voids of adjoining surfaces, particularly rough textures. Remove excess and spillage of sealant promptly as the work progresses. Clean adjoining surfaces by the means necessary to eliminate evidence of spillage, without damage to adjoining surfaces or finishes, as demonstrated in an approved mockup.
4. Cure sealant according to Section 079200 "Joint Sealants."

G. Where repointing work precedes cleaning of existing masonry, allow mortar to harden at least 30 days before beginning cleaning work.

3.14 FINAL CLEANING

A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, spray applied at low pressure.
   1. Do not use metal scrapers or brushes.
   2. Do not use acidic or alkaline cleaners.
B. Wash adjacent woodwork and other non-masonry surfaces. Use detergent and soft brushes or cloths.
C. Clean mortar and debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.

D. Sweep and rake adjacent pavement and grounds to remove mortar and debris. Where necessary, pressure wash pavement surfaces to remove mortar, dust, dirt, and stains.

3.15 FIELD QUALITY CONTROL

A. Inspectors: Owner will engage qualified independent inspectors to perform inspections and prepare test reports. Allow inspectors use of lift devices and scaffolding, as needed, to perform inspections.

B. Architect's Project Representatives: Architect will assign Project representatives to help carry out Architect's responsibilities at the site, including observing progress and quality of portion of the Work completed. Allow Architect's Project representatives use of lift devices and scaffolding, as needed, to observe progress and quality of portion of the Work completed.

C. Notify inspectors and Architect's Project representatives in advance of times when lift devices and scaffolding will be relocated. Do not relocate lift devices and scaffolding until inspectors and Architect's Project representatives have had reasonable opportunity to make inspections and observations of work areas at lift device or scaffold location.

END OF SECTION 040120
SECTION 040140 - MAINTENANCE OF STONE ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. This project may require extended work hours in order to meet the completion date. See Specification Section 00210 for Phasing and Schedule Requirements.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.


1.2 SUMMARY

A. Section includes maintenance of stone assemblies consisting of stone restoration and cleaning as follows:

1. Repairing stone masonry, including replacing partial units.
2. Preliminary cleaning, including removing plant growth.
3. Cleaning exposed stone surfaces.
4. Painting steel uncovered during the work.
5. Repointing joints.

B. Related Sections:

1. Section 013591 "Historic Treatment Procedures."

1.3 ALLOWANCES

A. Allowances for stone restoration and cleaning are specified in Section 012100 "Allowances."

1. Perform stone restoration and cleaning work under quantity allowances and only as authorized. Authorized work includes work required by Drawings and the Specifications and only work authorized in writing by Architect.
2. Notify Architect/Owner of extent of work performed that is attributable to quantity allowances.
3. Perform work that exceeds quantity allowances only as authorized by Change Orders.

B. Provide preconstruction testing as part of testing and inspecting allowance.

C. Remove and replace stone as part of stone removal and replacement allowance.

D. Replace partial stone (dutchman repair) as part of partial stone replacement allowance.

E. Inject cracks as part of crack-injection allowance.

F. Patch stone units as part of stone patching allowance.

G. Repoint stonework as part of repointing allowance.

1.4 UNIT PRICES

A. Work of this Section is affected by unit prices specified in Section 012200 "Unit Prices."
   1. Unit prices apply to authorized work covered by quantity allowances.
   2. Unit prices apply to additions to and deletions from Work as authorized by Change Orders.

1.5 DEFINITIONS

A. Very Low-Pressure Spray: Under 100 psi

B. Low-Pressure Spray: 100 to 400 psi; 4 to 6 gpm.

C. Medium-Pressure Spray: 400 to 800 psi; 4 to 6 gpm.

D. High-Pressure Spray: 800 to 1200 psi; 4 to 6 gpm.


F. Face Bedding: Setting of stone with the natural bedding planes (strata) vertical and parallel to the wall plane rather than horizontal or "naturally bedded," which holds bedding planes together by gravity.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include recommendations for application and use. Include test data substantiating that products comply with requirements.

B. Shop Drawings: For the following:
1. Replacement stone units and their jointing, showing relation of existing to new units. **(Reserved if needed)**
2. Partial replacement stone units (dutchmen).
3. Setting number of each new stone unit and its location on the structure in annotated plans and elevations. **(Reserved if needed)**
4. Provisions for expansion joints or other sealant joints.
5. Provisions for flashing, lighting fixtures, conduits, and weep holes as required.
6. Replacement and repair anchors, including drilled-in pins. Include details of anchors within individual stone units, with locations of anchors and dimensions of holes and recesses in stone required for anchors, including direction and angle of holes for pins.

C. Samples for Initial Selection: For the following:

1. **Pointing Mortar:** Submit sets of mortar for pointing in the form of sample mortar strips, 6 inches (150 mm) long by 1/4 inch (6 mm) wide, set in aluminum or plastic channels.
   a. Have each set contain a close color range of at least three Samples of different mixes of colored sands and cements that produce a mortar matching the cleaned stone when cured and dry.
   b. Submit with precise measurements on ingredients, proportions, gradations, and sources of colored sands from which each Sample was made.

2. **Patching Compound:** Submit sets of patching compound Samples in the form of plugs (patches in drilled holes) in sample units of stone representative of the range of stone colors on the building.
   a. Have each set contain a close color range of at least three Samples of different mixes of patching compound that matches the variations in existing stone when cured and dry.

3. **Sealant Materials:** See Section 079200 "Joint Sealants."
4. Include similar Samples of accessories involving color selection.

D. Samples for Verification: For the following:

1. Each type of replacement stone. Include sets of Samples as necessary to show full range of color, texture, grain, veining, and finish to be expected. Provide sets of at least three 6-by-6-inch Samples for each type, but no fewer than necessary to indicate full range and the proportion of variations within range.
2. Each type of sand used for pointing mortar; minimum 1 lb (0.5 kg) of each in plastic screw-top jars.
   a. For blended sands, provide Samples of each component and blend.
   b. Identify sources, both supplier and quarry, of each type of sand.
3. Each type, color, and texture of pointing mortar in the form of sample mortar strips, 6 inches (150 mm) long by 1/4 inch (6 mm) wide, set in aluminum or plastic channels.
   a. Include with each Sample a list of ingredients with proportions of each. Identify sources, both supplier and quarry, of each type of sand and brand names of cementitious materials and pigments if any.

4. Each type of stone patching compound in form of briquettes, at least 3 inches (75 mm) long by 1-1/2 inches (38 mm) wide. Document each Sample with manufacturer and stock number or other information necessary to order additional material.

5. Each type of adhesive.


7. Accessories: Each type of anchor, accessory, and miscellaneous support.

1.7 INFORMATIONAL SUBMITTALS

A. Quality-Control Program.

B. Restoration Program.

C. Cleaning Program.

1.8 QUALITY ASSURANCE

A. Restoration Specialist Qualifications: Engage an experienced, preapproved stone restoration and cleaning firm to perform work of this Section. Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience installing standard unit masonry or new stone masonry is not sufficient experience for stone restoration work.

1. At Contractor's option, work may be divided between two specialist firms: one for cleaning work and one for repair work.

2. Field Supervision: Restoration specialist firms shall maintain experienced full-time supervisors on Project site during times that stone restoration and cleaning work is in progress. Supervisors shall not be changed during Project except for causes beyond control of restoration specialist firm.

3. Restoration Worker Qualifications: Persons who are experienced in restoration work of types they will be performing.

B. Chemical-Cleaner Manufacturer Qualifications: A firm regularly engaged in producing masonry cleaners that have been used for similar applications with successful results, and with factory-trained representatives who are available for consultation and Project-site inspection and assistance at no additional cost.
C. Consolidant Manufacturer Qualifications: A firm regularly engaged in producing stone consolidants that have been used for similar applications with successful results, and with factory-trained representatives who are available for consultation and Project-site inspection and assistance at no additional cost.

D. Source Limitations: Obtain each type of material for stone restoration (stone, cement, sand, etc.) from one source with resources to provide materials of consistent quality in appearance and physical properties.

E. Quality-Control Program: Prepare a written quality-control program for this Project to systematically demonstrate the ability of personnel to properly follow methods and use materials and tools without damaging masonry. Include provisions for supervising performance and preventing damage due to worker fatigue.

F. Restoration Program: Prepare a written, detailed description of materials, methods, equipment, and sequence of operations to be used for each phase of restoration work including protection of surrounding materials and Project site.
   1. Include methods for keeping pointing mortar damp during curing period.
   2. If materials and methods other than those indicated are proposed for any phase of restoration work, add to the Quality-Control Program a written description of such materials and methods, including evidence of successful use on comparable projects, and demonstrations to show their effectiveness for this Project and worker's ability to use such materials and methods properly.

G. Cleaning Program: Prepare a written cleaning program that describes cleaning process in detail, including materials, methods, and equipment to be used, protection of surrounding materials, and control of runoff during operations.
   1. If materials and methods other than those indicated are proposed for any phase of restoration work, add to the Quality-Control Program a written description of such materials and methods, including evidence of successful use on comparable projects, and demonstrations to show their effectiveness for this Project and worker's ability to use such materials and methods properly.

H. Cleaning and Repair Appearance Standard: Cleaned and repaired surfaces are to have a uniform appearance as viewed from 20 feet away by Architect. Perform additional paint and stain removal, general cleaning, and spot cleaning of small areas that are noticeably different, so that surface blends smoothly into surrounding areas.

I. Mockups: Prepare mockups of restoration and cleaning to demonstrate aesthetic effects and set quality standards for materials and execution and for fabrication and installation.
   1. Stone Repair: Prepare sample areas for each type of stone indicated to have repair work performed. Erect sample areas in existing walls unless otherwise indicated, to demonstrate quality of materials, workmanship, and blending with existing work. Include the following as a minimum:
b. Stone Plug Repair: 1 stone plug repairs for each type of stone indicated to be plugged.
c. Crack Injection: Apply crack injection in 2 separate areas

2. Repointing: Rake out joints in 2 separate areas, each approximately 24 inches (900 mm) high by 36 inches (1200 mm) wide for each type of repointing required and repoint one of the areas.

3. Consolidation: Apply stone consolidation treatment to an area approximately 4 sq. ft. (0.4 sq. m)

4. Cleaning: Clean one sill (or NE watertable sill) in each elevation direction.
   a. Test cleaners and methods on samples of adjacent materials for possible adverse reactions. Do not use cleaners and methods known to have deleterious effect.
   b. Allow a waiting period of not less than seven days after completion of sample cleaning to permit a study of sample panels for negative reactions.

5. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

6. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

J. Preinstallation Conference: Conduct conference at Project site
   1. Review methods and procedures related to stone restoration and cleaning including, but not limited to, the following:
      b. Materials, material application, sequencing, tolerances, and required clearances.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver stone units to Project site strapped together in suitable packs or pallets or in heavy-duty crates.

B. Deliver each piece of granite with code mark or setting number on unexposed face, corresponding to Shop Drawings, using nonstaining paint.

C. Deliver other materials to Project site in manufacturer’s original and unopened containers, labeled with manufacturer’s name and type of products.

D. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
E. Store hydrated lime in manufacturer's original and unopened containers. Discard lime if containers have been damaged or have been opened for more than two days.

F. Store lime putty covered with water in sealed containers.

G. Store sand where grading and other required characteristics can be maintained and contamination avoided.

1.10 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit stone restoration and cleaning work to be performed according to manufacturers' written instructions and specified requirements.

B. Repair stone units and repoint mortar joints only when air temperature is between 40 and 90 deg F (4 and 32 deg C) and is predicted to remain so for at least 7 days after completion of the Work unless otherwise indicated.

C. Cold-Weather Requirements: Comply with the following procedures for stone repair and mortar-joint pointing unless otherwise indicated:

1. When air temperature is below 40 deg F (4 deg C), heat mortar ingredients, repair materials, and existing stone to produce temperatures between 40 and 120 deg F (4 and 49 deg C).
2. When mean daily air temperature is below 40 deg F (4 deg C), provide enclosure and heat to maintain temperatures above 32 deg F (0 deg C) within the enclosure for 7 days after repair and pointing.

D. Hot-Weather Requirements: Protect stone repair and mortar-joint pointing when temperature and humidity conditions produce excessive evaporation of water from mortar and patching materials. Provide artificial shade and wind breaks and use cooled materials as required to minimize evaporation. Do not apply mortar to substrates with temperatures of 90 deg F (32 deg C) and above unless otherwise indicated.

E. For manufactured repair materials, perform work within the environmental limits set by each manufacturer.

F. Clean stone surfaces only when air temperature is 40 deg F (4 deg C) and above and is predicted to remain so for at least 7 days after completion of cleaning.

G. Apply stone consolidation treatment only when surface and air temperatures are between 50 and 90 deg F (10 and 32 deg C) and rain is not expected within 24 hours.

1.11 COORDINATION

A. Coordinate stone restoration and cleaning with public circulation patterns at Project site. Some work is near public circulation patterns and building entrances. Public
circulation patterns cannot be closed off entirely, and in places can be only temporarily redirected around small areas of work. Plan and execute the Work accordingly.

1.12 SEQUENCING AND SCHEDULING

A. Order replacement materials at earliest possible date to avoid delaying completion of the Work.

B. Perform stone restoration work in the following sequence:

1. Remove plant growth.
2. Inspect for open mortar joints and repair before cleaning to prevent the intrusion of water and other cleaning materials into the wall.
3. Remove paint.
5. Where water repellents, specified in Section 071900 "Water Repellents," are to be used on or near stonework, delay application of these chemicals until after pointing.
6. Rake out mortar from joints surrounding stone to be replaced and from joints adjacent to stone repairs along joints.
7. Repair stonework, including replacing existing stone with new stone.
8. Rake out mortar from joints to be repointed.
10. After repairs and repointing have been completed and cured, perform a final cleaning to remove residues from this work.
11. Inspect for open mortar joints and repair before cleaning to prevent the intrusion of water and other cleaning materials into the wall.
12. Remove paint.
13. Clean stone surfaces.

PART 2 - PRODUCTS

2.1 STONE MATERIALS

A. Salvaged Stone: Obtain salvaged stone, as required, from locations shown on Drawings.

2.2 MANUFACTURED REPAIR MATERIALS

A. Stone Patching Compound: Factory-mixed cementitious product that is custom manufactured for patching stone.

1. **Products**: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
b. Conproco Corporation; [Mimic] [Matrix].
c. Edison Coatings, Inc.; Custom System 45.

2. Use formulation that is vapor- and water permeable (equal to or more than the stone), exhibits low shrinkage, has lower modulus of elasticity than the stone units being repaired, and develops high bond strength to all types of stone.

3. Use formulation having working qualities and retardation control to permit forming and sculpturing where necessary.

4. Formulate patching compound in colors, textures, and grain to match stone being patched. Provide not less than three colors to enable matching each piece of stone.

B. Cementitious Crack Filler: An ultrafine superplasticized grout that can be injected into cracks, is suitable for application to wet or dry cracks, exhibits low shrinkage, and develops high bond strength to all types of stone.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   b. Conproco Corporation; Terra Cotta Finish.

C. Stone-to-Stone Adhesive: 2-part polyester or epoxy-resin stone adhesive with a 15- to 45-minute cure at 70 deg F or 1-part cementitious stone adhesive, recommended by adhesive manufacturer for type of stone repair indicated, and matching stone color.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. Two-Part Polyester or Epoxy-Resin Stone Adhesive:

      1) Akemi North America; [Akepox] [Platinum] [MS76 Stone and Marble Adhesive].
      2) Bonstone Materials Corporation; Fast Set 41.
      3) Edison Coatings, Inc.; Flexi-Weld 520T.
      4) <Insert manufacturer's name; product name or designation>.

   b. One-Part Cementitious Stone Adhesive:

      1) Cathedral Stone Products, Inc.; Jahn Restoration Adhesive.
      2) <Insert manufacturer's name; product name or designation>.

D. Stone Consolidation Treatment: Ready-to-use product designed for consolidation of stone that has deteriorated due to weathering and exposure to pollutants. Treatment shall be composed of silicic-ethyl esters, a neutral catalyst, and solvents.
1. **Products**: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. **Akemi North America**: Stone Strengthener K.
   b. **Cohalan Company, Inc.**: Keim Silex OH.
   c. **Diedrich Technologies Inc.**: D50C.
   d. **PROSOCO**: Conservare OH100 Stone Strengthener with HCT pretreatment.

E. Stone Consolidation and Water-Repellent Treatment: Ready-to-use product designed for consolidation and water-repellent treatment of stone that has deteriorated due to weathering and exposure to pollutants. Treatment shall be composed of silicic-ethyl esters, a neutral catalyst, a silane water repellent, and solvents.

1. **Products**: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. **Cohalan Company, Inc.**: Keim Silex H.
   b. **Diedrich Technologies Inc.**: D50W.
   c. **PROSOCO**: Conservare H100 Stone Strengthener with HCT pretreatment.

2.3 PAINT REMOVERS

A. Alkaline Paste Paint Remover: Manufacturer's standard alkaline paste formulation for removing paint coatings from masonry.

1. **Products**: Subject to compliance with requirements, provide the following:

   a. **PROSOCO**: [Enviro Klean Safety Peel 2] [Sure Klean Heavy-Duty Paint Stripper] [or] [Sure Klean Heavy-Duty Paint Stripper D].

B. Covered or Skin-Forming Alkaline Paint Remover: Manufacturer's standard covered or skin-forming alkaline formulation for removing paint coatings from masonry.

1. **Products**: Subject to compliance with requirements, provide the following:

   a. **PROSOCO**: Enviro Klean Safety Peel 1 or Enviro Klean Safety Peel 3 with Enviro Klean Overcoat.

C. Solvent-Type Paint Remover: Manufacturer's standard water-rinsable, solvent-type gel formulation for removing paint coatings from masonry.

1. **Products**: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
D. Low-Odor, Solvent-Type Paint Remover: Manufacturer's standard low-odor, water-rinsable solvent-type gel formulation, containing no methanol or methylene chloride, for removing paint coatings from masonry.

1. **Products**: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   
   a. **ABR Products, Inc.**; Super Bio Strip Gel.
   b. **Cathedral Stone Products, Inc.**; [S-301] [S-303] [or] [S-305].
   c. **Dumond Chemicals, Inc.**; [Peel Away 6] [Peel Away 7] [or] [Peel Away 21].
   d. **PROSOCO**; [Enviro Klean Safety Peel 1] [or] [Enviro Klean Safety Peel 3].

2.4 CLEANING MATERIALS

A. Water: Potable.

B. Hot Water: Water heated to a temperature of 140 to 160 deg F (60 to 71 deg C).

C. Job-Mixed Detergent Solution: Solution prepared by mixing 2 cups (0.5 L) of tetrasodium polyphosphate, 1/2 cup (125 mL) of laundry detergent, and 20 quarts (20 L) of hot water for every 5 gal. (20 L) of solution required.

D. Job-Mixed Mold, Mildew, and Algae Remover: Solution prepared by mixing 2 cups (0.5 L) of tetrasodium polyphosphate, 5 quarts (5 L) of 5 percent sodium hypochlorite (bleach), and 15 quarts (15 L) of hot water for every 5 gal. (20 L) of solution required.

E. Nonacidic Gel Cleaner: Manufacturer's standard gel formulation, with pH between 6 and 9, that contains detergents with chelating agents and is specifically formulated for cleaning masonry surfaces.

1. **Products**: Subject to compliance with requirements, [provide the following] [provide one of the following] [available products that may be incorporated into the Work include, but are not limited to, the following]:

   a. **Price Research, Ltd.**; Price Marble Cleaner-Gel.
   b. **PROSOCO**; Sure Klean 942 Limestone and Marble Cleaner.
F. Nonacidic Liquid Cleaner: Manufacturer's standard mildly alkaline liquid cleaner formulated for removing mold, mildew, and other organic soiling from ordinary building materials, including polished stone, brick, aluminum, plastics, and wood.

1. **Products**: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. [Diedrich Technologies Inc.](#); Diedrich 910PM Polished Marble Cleaner.
   
   b. [Dominion Restoration Products, Inc.](#); Bio-Cleanse.
   
   c. [Dumond Chemicals, Inc.](#); Safe n' Easy Architectural Cleaner/Restorer.
   
   d. [Price Research, Ltd.](#); Price Non-Acid Masonry Cleaner.
   
   e. [PROSOCO](#); Enviro Klean 2010 All Surface Cleaner.

2.5 ACCESSORY MATERIALS

A. Liquid Strippable Masking Agent: Manufacturer's standard liquid, film-forming, strippable masking material for protecting glass, metal, and polished stone surfaces from damaging effects of acidic and alkaline masonry cleaners.

1. **Products**: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. [ABR Products, Inc.](#); Rubber Mask.
   
   b. [Price Research, Ltd.](#); Price Mask.
   
   c. [PROSOCO](#); Sure Klean Strippable Masking.

B. **Stone Anchors and Pins**: Type and size indicated or, if not indicated, to match existing anchors in size and type.

C. **Sealant Materials**:

   1. Provide manufacturer's standard chemically curing, elastomeric sealant(s) of base polymer and characteristics indicated below that comply with applicable requirements in Section 079200 "Joint Sealants."

      a. **Single-component, nonsag urethane sealant**

   2. Colors: Provide colors of exposed sealants to match colors of stonework adjoining installed sealant unless otherwise indicated.

D. **Joint-Sealant Backing**:

   1. Cylindrical Sealant Backings: ASTM C 1330, Type C closed-cell material with a surface skin) or Type B (bicellular material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
2. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

E. Setting Buttons: Resilient plastic buttons, nonstaining to stone, sized to suit joint thicknesses and bed depths of stone units without intruding into required depths of pointing materials.

F. Masking Tape: Nonstaining, nonabsorbent material, compatible with pointing mortar, joint primers, sealants, and surfaces adjacent to joints; that will easily come off entirely, including adhesive.

G. Antirust Coating: Fast-curing, lead- and chromate-free, self-curing, universal modified-alkyd primer complying with MPI #79, Alkyd Anticorrosive Metal Primer or SSPC-Paint 20 or SSPC-Paint 29 zinc-rich coating

1. Use coating requiring no better than SSPC-SP 2, "Hand Tool Cleaning" surface preparation according to manufacturer's literature or certified statement.
2. Use coating with a VOC content of \[420 \text{ g/L (3.5 lb/gal.)}\] or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

H. Miscellaneous Products: Select materials and methods of use based on the following, subject to approval of a mockup:

1. Previous effectiveness in performing the work involved.
2. Little possibility of damaging exposed surfaces.
3. Consistency of each application.
4. Uniformity of the resulting overall appearance.
5. Do not use products or tools that could do the following:

   a. Remove, alter, or in any way harm the present condition or future preservation of existing surfaces, including surrounding surfaces not in contract.
   b. Leave a residue on surfaces.

2.6 MORTAR MIXES

A. Preparing Lime Putty: Slake quicklime and prepare lime putty according to appendix to ASTM C 5 and manufacturer's written instructions.

B. Measurement and Mixing: Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.

1. Mixing Pointing Mortar: Thoroughly mix cementitious materials and sand together before adding any water. Then mix again adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for 15 to 30 minutes. Add
remaining water in small portions until mortar reaches desired consistency. Use mortar within one hour of final mixing; do not retemper or use partially hardened material.

C. Colored Mortar: Produce mortar of color required by using specified ingredients. Do not alter specified proportions without Architect's approval.

1. Mortar Pigments: Where mortar pigments are indicated, do not exceed a pigment-to-cement ratio of 1:10 by weight.

D. Do not use admixtures in mortar unless otherwise indicated.

E. See Section 042113 Brick Masonry (2.8) for mix type.

2.7 CHEMICAL CLEANING SOLUTIONS

A. Dilute chemical cleaners with water to produce solutions not exceeding concentration recommended by chemical-cleaner manufacturer.

PART 3 - EXECUTION

3.1 PROTECTION

A. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from stone restoration work.

1. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during course of restoration and cleaning work.

B. Comply with chemical-cleaner manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products. Prevent chemical cleaning solutions from coming into contact with people, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.

1. Cover adjacent surfaces with materials that are proven to resist chemical cleaners used unless chemical cleaners being used will not damage adjacent surfaces. Use materials that contain only waterproof, UV-resistant adhesives. Apply masking agents to comply with manufacturer's written instructions. Do not apply liquid masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining.

2. Keep wall wet below area being cleaned to prevent streaking from runoff.

3. Do not clean stone during winds of sufficient force to spread cleaning solutions to unprotected surfaces.

4. Neutralize and collect alkaline and acid wastes for disposal off Owner's property.
5. Dispose of runoff from cleaning operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.

C. Prevent mortar from staining face of surrounding stone and other surfaces.
   1. Cover sills, ledges, and projections to protect from mortar droppings.
   2. Keep wall area wet below rebuilding and pointing work to discourage mortar from adhering.
   3. Immediately remove mortar in contact with exposed stone and other surfaces.
   4. Clean mortar splatters from scaffolding at end of each day.

D. Remove gutters and downspouts adjacent to stone and store where indicated during stone restoration and cleaning. Reinstall when stone restoration and cleaning are complete.
   1. Provide temporary rain drainage during work as indicated to direct water away from building.

3.2 STONE REMOVAL AND REPLACEMENT

A. At locations indicated, remove stone that has deteriorated or is damaged beyond repair. Carefully demolish or remove entire units from joint to joint, without damaging surrounding stone, in a manner that permits replacement with full-size units.

B. Support and protect remaining stonework that surrounds removal area. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition.

C. Notify Architect of unforeseen detrimental conditions including voids, cracks, bulges, and loose units in existing stone or unit masonry backup, rotted wood, rusted metal, and other deteriorated items.

D. Remove in an undamaged condition as many whole stone units as possible.
   1. Remove mortar, loose particles, and soil from stone by cleaning with hand chisels, brushes, and water.
   2. Remove sealants by cutting close to stone with utility knife and cleaning with solvents.
   3. Store stone for reuse. Store off ground, on skids, and protected from weather.
   4. Deliver cleaned stone not required for reuse to Owner unless otherwise indicated.

E. Clean stone surrounding removal areas by removing mortar, dust, and loose particles in preparation for replacement.
3.3 PARTIAL STONE REPLACEMENT

A. Remove defective portion of existing stone unit (backing stone). Carefully remove defective portion of stone by making vertical and horizontal saw cuts at face of backing stone and demolishing defective material to depth required for fitting partial replacement (dutchman).

1. Make edges of backing stone at cuts smooth and square to each other and to finished surface; essentially rectangular. Make back of removal area flat and parallel to stone face.
2. Do not overcut at corners and intersections. Hand trim to produce clean sharp corners with no rounding and no damage to existing work to remain.
3. If existing stone that is to remain becomes damaged, remove damaged area and enlarge partial replacement as required.

B. Remove mortar from joints that abut area of stone removal to same depth as stone was removed. Remove loose mortar particles and other debris from surfaces to be bonded and surfaces of adjacent stone units that will receive mortar by cleaning with stiff-fiber brush.

C. Cut and trim partial replacement to accurately fit area where material was removed from backing stone. Fabricate to size required to produce joints between partial replacement and backing stone of no more than $\frac{1}{16}$ inch in width, and joints between partial replacement and other stones that match existing joints between stones.

D. Pinning: Before applying adhesive, prepare for mechanical anchorage consisting of $\frac{1}{4}$-inch- (6-mm-) diameter, stainless-steel pins set into $\frac{1}{4}$-inch- diameter holes drilled at a 45-degree downward angle through face of partial replacement and into backing stone. Center and space pins between 3 and 5 inches (75 and 125 mm) apart and at least 2 inches (50 mm) from any edge. Insert pins at least 2 inches (50 mm) into backing stone and 2 inches (50 mm) into partial replacement with end countersunk at least $\frac{3}{4}$ inch (19 mm) from exposed face of partial replacement.

E. Concealed Pinning: Before applying adhesive, prepare for concealed mechanical anchorage consisting of $\frac{1}{4}$-inch- (6-mm-) diameter, stainless-steel pins set into $\frac{1}{4}$-inch- (6-mm-) diameter holes drilled into backing stone and into, but not through, the partial replacement. Center and space pins between 3 and 5 inches (75 and 125 mm) apart and at least 2 inches (50 mm) from any edge. Insert pins at least 2 inches (50 mm) into backing stone and 2 inches (50 mm) into partial replacement, but no closer than $\frac{3}{4}$ inch (19 mm) from exposed face of partial replacement.

F. Apply stone-to-stone adhesive to comply with adhesive manufacturer’s written instructions. Coat bonding surfaces of backing stone and partial replacement, completely filling all crevices and voids.

G. Apply partial replacement while adhesive is still tacky and hold securely in place until adhesive has cured. Use shims, clamps, wedges, or other devices as necessary to align face of partial replacement with face of backing stone.
H. Clean adhesive residue from exposed surfaces and patch chipped areas as specified in "Stone Patching" Article.

3.4 STONE-FRAGMENT REPAIR

A. Carefully remove cracked or fallen stone fragment indicated to be repaired. Reuse only stone fragment that is in sound condition.

B. Remove soil, loose particles, mortar, and other debris or foreign material, from fragment surfaces to be bonded and from parent stone where fragment had broken off, by cleaning with stiff-fiber brush.

C. Pinning: Before applying adhesive, prepare for mechanical anchorage consisting of 1/4-inch- (6-mm-) diameter, stainless-steel pins set into 1/4-inch- (6-mm-) diameter holes drilled at a 45-degree downward angle through face of fragment and into parent stone. Center and space pins between 3 and 5 inches (75 and 125 mm) apart and at least 2 inches (50 mm) from any edge. Insert pins at least 2 inches (50 mm) into parent stone and 2 inches (50 mm) into fragment with end countersunk at least 3/4 inch (19 mm) from exposed face of fragment.

D. Concealed Pinning: Before applying adhesive, prepare for concealed mechanical anchorage consisting of 1/4-inch- (6-mm-) diameter, stainless-steel pins set into 1/4-inch- (6-mm-) diameter holes drilled into parent stone and into, but not through, the fragment. Center and space pins between 3 and 5 inches (75 and 125 mm) apart and at least 2 inches (50 mm) from any edge. Insert pins at least 2 inches (50 mm) into parent stone and 2 inches (50 mm) into fragment, but no closer than 3/4 inch (19 mm) from exposed face of fragment.

E. Apply stone-to-stone adhesive to comply with adhesive manufacturer's written instructions. Coat bonding surfaces of fragment and parent stone, completely filling all crevices and voids.

F. Fit stone fragment onto parent stone while adhesive is still tacky and hold fragment securely in place until adhesive has cured. Use shims, clamps, wedges, or other devices as necessary to align face of fragment with face of parent stone.

G. Clean adhesive residue from exposed surfaces and patch chipped areas as specified in "Stone Patching" Article.

3.5 CRACK INJECTION

A. General: Comply with cementitious crack-filler manufacturer's written instructions.

B. Drill 1/4-inch diameter injection holes as follows:

1. Drill holes 2 inches deep. Where possible drill holes in mortar joints.
C. Clean out drill holes and cracks with compressed air and water. Remove dirt and organic matter, loose material, sealants, and failed crack repair materials.

D. Place plastic injection ports in drilled holes and seal face of cracks between injection ports with clay or other nonstaining, removable plugging material. Leave openings at upper ends of cracks for air release.

E. Inject cementitious crack filler through ports sequentially, beginning at one end of area and working to opposite end; where possible, begin at lower end of injection area and work upward. Inject filler until it extrudes from adjacent ports. After port has been injected, plug with clay or other suitable material and begin injecting filler at adjacent port, repeating process until all ports have been injected.

F. Clean cementitious crack filler from face of stone before it sets by scrubbing with water.

G. After cementitious crack filler has set, remove injection ports, plugging material, and excess filler. Patch injection holes and surface of cracks as specified in "Stone Patching" Article.

3.6 STONE PATCHING

A. Patch the following stone units unless another type of replacement or repair is indicated:

1. Units indicated to be patched.
2. Units with holes.
3. Units with chipped edges or corners.
4. Units with small areas of deep deterioration.

B. Remove and replace existing patches unless otherwise indicated or approved by Architect.

C. Remove deteriorated material and remove adjacent material that has begun to deteriorate. Carefully remove additional material so patch will not have feathered edges but will have square or slightly undercut edges on area to be patched and will be at least 1/4 inch (6 mm) thick, but not less than recommended by patching compound manufacturer.

D. Mask adjacent mortar joint or rake out for repointing if patch will extend to edge of stone unit.

E. Mix patching compound in individual batches to match each stone unit being patched. Combine one or more colors of patching compound, as needed, to produce exact match.

F. Brush-coat stone surfaces with slurry coat of patching compound according to manufacturer's written instructions.
G. Place patching compound in layers as recommended by patching compound manufacturer, but not less than 1/4 inch or more than 2 inches thick. Roughen surface of each layer to provide a key for next layer.

1. Trowel, scrape, or carve surface of patch to match texture and surrounding surface plane or contour of the stone. Shape and finish surface before or after curing, as determined by testing, to best match existing stone.

2. Build patch up 1/4 inch above surrounding stone and carve surface to match adjoining stone after patching compound has hardened.

H. Keep each layer damp for 72 hours or until patching compound has set.

I. Remove and replace patches with hairline cracks or that show separation from stone at edges, and those that do not match adjoining stone in color or texture.

3.7 CLEANING STONE, GENERAL

A. Proceed with cleaning in an orderly manner; work from top to bottom of each scaffold width and from one end of each elevation to the other. Ensure that dirty residues and rinse water will not wash over cleaned, dry surfaces.

B. Use only those cleaning methods indicated for each stone material and location.

1. Do not use wire brushes or brushes that are not resistant to chemical cleaner being used. Do not use plastic-bristle brushes if natural-fiber brushes will resist chemical cleaner being used.

2. Use spray equipment that provides controlled application at volume and pressure indicated, measured at spray tip. Adjust pressure and volume to ensure that cleaning methods do not damage stone.

a. Equip units with pressure gages.

3. For chemical-cleaner spray application, use low-pressure tank or chemical pump suitable for chemical cleaner indicated, equipped with cone-shaped spray tip.

4. For water-spray application, use fan-shaped spray tip that disperses water at an angle of 25 to 50 degrees.

5. For high-pressure water-spray application, use fan-shaped spray tip that disperses water at an angle of at least 40 degrees.

6. For heated water-spray application, use equipment capable of maintaining temperature between 140 and 160 deg F at flow rates indicated.

7. For steam application, use steam generator capable of delivering live steam at nozzle.

C. Perform each cleaning method indicated in a manner that results in uniform coverage of all surfaces, including corners, moldings, and interstices, and that produces an even effect without streaking or damaging stone surfaces.

D. Water Application Methods:
1. Water-Soak Application: Soak stone surfaces by applying water continuously and uniformly to limited area for time indicated. Apply water at low pressures and low volumes in multiple fine sprays using perforated hoses or multiple spray nozzles. Erect a protective enclosure constructed of polyethylene sheeting to cover area being sprayed.

2. Water-Spray Applications: Unless otherwise indicated, hold spray nozzle at least 6 inches (150 mm) from surface of stone and apply water in horizontal back and forth sweeping motion, overlapping previous strokes to produce uniform coverage.

E. Steam Cleaning: Apply steam to stone surfaces at the very low pressures indicated for each type of stonework. Hold nozzle at least 6 inches (150 mm) from surface of stone and apply steam in horizontal back and forth sweeping motion, overlapping previous strokes to produce uniform coverage.

F. After cleaning is complete, remove protection no longer required. Remove tape and adhesive marks.

3.8 PRELIMINARY CLEANING

A. Removing Plant Growth: Completely remove visible plant, moss, and shrub growth from stone surfaces. Carefully remove plants, creepers, and vegetation by cutting at roots and allowing to dry as long as possible before removal. Remove loose soil or debris from open joints to whatever depth they occur.

B. Preliminary Cleaning: Before beginning general cleaning, remove extraneous substances that are resistant to cleaning methods being used. Extraneous substances include paint, calking, asphalt, and tar.

1. Carefully remove heavy accumulations of material from surface of stone with sharp chisel. Do not scratch or chip stone surface.
2. Remove paint and calking with alkaline paint remover.
   b. Repeat application up to two times if needed.
3. Remove asphalt and tar with solvent-type paint remover.
   b. Apply paint remover only to asphalt and tar by brush without prewetting.
   c. Allow paint remover to remain on surface for 10 to 30 minutes.
   d. Repeat application if needed.

3.9 CLEANING STONEWORK

A. Cold-Water Soak:

1. Apply cold water by intermittent spraying to keep surface moist.
2. Use perforated hoses or other means that will apply a fine water mist to entire surface being cleaned.
3. Apply water in cycles with at least 30 minutes between cycles.
4. Continue spraying until surface encrustation has softened sufficiently to permit its removal by water wash, as indicated by cleaning tests.
5. Continue spraying for 72 hours.
6. Remove soil and softened surface encrustation from stone with cold water applied by low-pressure spray.

B. Hot-Water Wash: Use hot water applied by low pressure spray.

C. Steam Cleaning: Apply steam at very low pressures not exceeding [30 psi (207 kPa)]
Remove dirt softened by steam with wood scrapers, stiff-nylon or -fiber brushes, or cold-water wash, as indicated by cleaning tests.

D. Detergent Cleaning:
1. Wet stone with water applied by low-pressure spray.
2. Scrub stone with detergent solution using medium-soft brushes until soil is thoroughly dislodged and can be removed by rinsing. Use small brushes to remove soil from mortar joints and crevices. Dip brush in solution often to ensure that adequate fresh detergent is used and that stone surface remains wet.
3. Rinse with water applied by low-pressure spray to remove detergent solution and soil.
4. Repeat cleaning procedure above where required to produce cleaning effect established by mockup.

E. Mold, Mildew, and Algae Removal:
1. Wet stone with water applied by low-pressure spray.
2. Apply mold, mildew, and algae remover by brush.
3. Scrub stone with medium-soft brushes until mold, mildew, and algae are thoroughly dislodged and can be removed by rinsing. Use small brushes for mortar joints and crevices. Dip brush in mold, mildew, and algae remover often to ensure that adequate fresh cleaner is used and that stone surface remains wet.
4. Rinse with water applied by low pressure spray to remove mold, mildew, and algae remover and soil.
5. Repeat cleaning procedure above where required to produce cleaning effect established by mockup.

F. Nonacidic Liquid Chemical Cleaning:
1. Wet stone with water applied by low-pressure spray.
2. Apply cleaner to stone in two applications by brush.
3. Let cleaner remain on surface for period indicated below:
   a. As recommended by chemical-cleaner manufacturer.
   b. As established by mockup.
   c. Two to three minutes.
4. Rinse with water applied by low-pressure spray to remove chemicals and soil.
5. Repeat cleaning procedure above where required to produce cleaning effect established by mockup. Do not repeat more than once. If additional cleaning is required, use steam cleaning.

END OF SECTION 040140
SECTION 042113 - BRICK MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. This project may require extended work hours in order to meet the completion date. See Specification Section 00210 for Phasing and Schedule Requirements.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.


1.2 SUMMARY

A. Section Includes:
   1. Face brick.
   2. Mortar and grout.
   3. Ties and anchors.
   4. Embedded flashing.
   5. Miscellaneous masonry accessories.

B. Related Sections:
   1. Section 055000 "Metal Fabrications" for furnishing steel lintels for brick masonry.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For the following:
   1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
   2. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.

C. Samples for Verification: For each type and color of the following:
   1. Face brick, in the form of straps of five or more bricks.
   2. Pigmented mortar. Make Samples using same sand and mortar ingredients to be used on Project.
3. Weep holes and vents.
4. Accessories embedded in masonry.

1.4 INFORMATIONAL SUBMITTALS

A. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers’ product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.

1. Submittal is for information only. Neither receipt of list nor approval of mockup constitutes approval of deviations from the Contract Documents unless such deviations are specifically brought to the attention of Architect and approved in writing.

B. Material Certificates: For each type and size of the following:

1. Masonry units.
   a. Include data on material properties and material test reports substantiating compliance with requirements.
   b. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
   c. For exposed brick, include test report for efflorescence according to ASTM C 67.

2. Cementitious materials. Include brand, type, and name of manufacturer.
3. Pre-blended, dry mortar mixes. Include description of type and proportions of ingredients.
4. Grout mixes. Include description of type and proportions of ingredients.
5. Anchors, ties, and metal accessories.

C. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.5 QUALITY ASSURANCE

A. Source Limitations 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 single source from single manufacturer for each product required.

B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

C. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.
D. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockup of typical wall area as shown on Drawings.
2. Build mockups for each type of exposed unit masonry construction in sizes approximately 48 inches long by 60 inches high by full thickness, including accessories.
   a. Include a sealant-filled joint at least 16 inches long in each mockup.
   b. Include lower corner of window opening at upper corner of exterior wall mockup. Make opening approximately 12 inches wide by 16 inches high.
   c. Include through-wall flashing installed for a 24-inch length in corner of exterior wall mockup approximately 16 inches down from top of mockup, with a 12-inch length of flashing left exposed to view (omit masonry above half of flashing).
   d. Include masonry wall, air & water barrier, veneer anchors, flashing, cavity drainage material, and weep holes in mockup.
3. Where masonry is to match existing, erect mockups adjacent and parallel to existing surface.
4. Clean exposed faces of mockups with masonry cleaner as indicated.
5. Protect accepted mockups from the elements with weather-resistant membrane.
6. Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.
   a. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.
   b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by Architect in writing.
7. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Deliver pre-blended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store pre-blended, dry mortar mix in delivery containers on
elevated platforms, under cover, and in a dry location or in covered weatherproof dispensing silos.

E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.7 PROJECT CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day’s work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24 inches down both sides of walls and hold cover securely in place.
2. Where one wythe of multi-wythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe and hold cover in place.

B. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
2. Protect sills, ledges, and projections from mortar droppings.
3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

C. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

PART 2 - PRODUCTS

2.1 MASONRY UNITS, GENERAL

A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.

B. Fire-Resistance Ratings: Where indicated, provide units that comply with requirements for fire-resistance ratings indicated as determined by testing according to ASTM E 119, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

2.2 BRICK

A. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units.

1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
2. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.
3. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.
4. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

B. Face Brick: Facing brick complying with ASTM C 216

1. Products: Subject to compliance with requirements, provide the following:
2. To match existing in color size and texture
3. Initial Rate of Absorption: Less than 30 g/30 sq. in. per minute when tested per ASTM C 67.
4. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated “not effloresced.”
5. Application: Use where brick is exposed unless otherwise indicated.
6. Color, Texture, Size and Pattern:
   (3-5/8 inches wide by 2-1/4 inches high by 7-5/8 inches long)
   Provide blend and pattern matching pattern to the existing adjacent brickwork.
2.3 MORTAR MATERIALS

A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

B. Hydrated Lime: ASTM C 207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.

D. Masonry Cement: ASTM C 91.
   1. **Products**: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Lafarge North America Inc.; Magnolia Masonry Cement, Lafarge Masonry Cement
      b. Lehigh Cement Company; Lehigh Masonry Cement

E. Aggregate for Mortar: ASTM C 144.
   1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
   2. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
   3. White-Mortar Aggregates: Natural white sand or crushed white stone.
   4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

F. Cold-Weather Admixture: Non-chloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
   1. **Products**: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Euclid Chemical Company (The); Accelguard 80.
      c. Sonneborn Products, BASF Aktiengesellschaft; Trimix-NCA.

G. Water-Repellent Admixture: Liquid water-repellent mortar admixture, containing integral water repellent by same manufacturer.
   1. **Products**: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. ACM Chemistries, Inc.; RainBloc for Mortar.
      b. BASF Aktiengesellschaft; Rheopel Mortar Admixture.

2.4 REINFORCEMENT

A. Masonry Joint Reinforcement, General: ASTM A 951/A 951M.

2.5 TIES AND ANCHORS

A. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:

4. Galvanized Steel Sheet: ASTM A 653/A 653M
6. Stainless-Steel Sheet: ASTM A 666, Type 316.
7. Stainless-Steel Bars: ASTM A 276 or ASTM A 666, Type 316.

B. Adjustable Masonry-Veneer Anchors:

1. General: Provide anchors that allow vertical adjustment but resist tension and compression forces perpendicular to plane of wall, for attachment over sheathing to wood or metal studs, and as follows:

   a. Structural Performance Characteristics: Capable of withstanding a 100-lbf load in both tension and compression without deforming or developing play in excess of 0.05 inch.

2. Contractor's Option: Unless otherwise indicated, provide any of the following types of anchors:

3. Screw-Attached, Masonry-Veneer Anchors: Units consisting of a wire tie and a metal anchor section.

   a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

      1) Dayton Superior Corporation, Dur-O-Wal Division; D/A 213 or D/A 210 with D/A 700-708.
      2) Heckmann Building Products Inc.; 315-D with 316 or Pos-I-Tie.
      3) Hohmann & Barnard, Inc.; DW-10, DW-10HS, DW-10-X, or 2-Seal.
      4) Wire-Bond; 1004, Type III, RJ-711 or SureTie.
b. Anchor Section: Rib-stiffened, sheet metal plate with screw holes top and bottom, 2-3/4 inches wide by 3 inches high; with projecting tabs having slotted holes for inserting vertical legs of wire tie specially formed to fit anchor section.

c. Anchor Section: Sheet metal plate, 1-1/4 inches wide by 6 inches long, with screw holes top and bottom and with raised rib-stiffened strap, 5/8 inch wide by 5-1/2 inches long, stamped into center to provide a slot between strap and plate for inserting wire tie.

d. Anchor Section: Gasketed sheet metal plate, 1-1/4 inches wide by 6 inches long, top and bottom ends bent to form pronged legs of length to match thickness of insulation or sheathing; and raised rib-stiffened strap, 5/8 inch wide by 6 inches long, stamped into center to provide a slot between strap and plate for inserting wire tie. Provide anchor manufacturer's standard, self-adhering, modified bituminous gaskets manufactured to fit behind anchor plate and extend beyond pronged legs.

e. Anchor Section: Corrosion-resistant, self-drilling, eye-screw designed to receive wire tie. Eye-screw has spacer that seats directly against framing and is same thickness as sheathing and has gasketed, washer head that covers hole in sheathing.

f. Fabricate sheet metal anchor sections and other sheet metal parts from 1.05-inch-thick, steel sheet, galvanized after fabrication.

g. Wire Ties: Triangular-, rectangular-, or T-shaped wire ties fabricated from 0.25-inch-diameter, hot-dip galvanized steel wire.

2.6 EMBEDDED FLASHING MATERIALS

A. Metal Flashing: Provide metal flashing complying with Section 076200 "Sheet Metal Flashing and Trim" and as follows:

1. Stainless Steel: ASTM A 240/A 240M, Type 304, 0.016 inch thick.
2. Fabricate continuous flashings in sections 96 inches long minimum, but not exceeding 12 feet. Provide splice plates at joints of formed, smooth metal flashing.
3. Fabricate through-wall metal flashing embedded in masonry from stainless steel with ribs at 3-inch intervals along length of flashing to provide an integral mortar bond.

a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   1) Cheney Flashing Company; Cheney Flashing (Dovetail) or Cheney 3-Way Flashing (Sawtooth).
   3) Sandell Manufacturing Co., Inc.; Mechanically Keyed Flashing.
4. Fabricate through-wall flashing with snap lock receiver on exterior face where indicated to receive counter flashing.

5. Fabricate through-wall flashing with drip edge unless otherwise indicated. Fabricate by extending flashing 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.

6. Fabricate through-wall flashing with sealant stop unless otherwise indicated. Fabricate by bending metal back on itself 3/4 inch at exterior face of wall and down into joint 1/4 inch to form a stop for retaining sealant backer rod.

7. Fabricate metal drip edges and sealant stops for ribbed metal flashing from plain metal flashing of same metal as ribbed flashing and extending at least 3 inches into wall with hemmed inner edge to receive ribbed flashing and form a hooked seam. Form hem on upper surface of metal so that completed seam will shed water.

8. Metal Drip Edge: Fabricate from stainless steel. Extend at least 3 inches into wall and 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.

9. Metal Sealant Stop: Fabricate from stainless steel. Extend at least 3 inches into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for 3/4 inch and down into joint 1/4 inch to form a stop for retaining sealant backer rod.

B. Flexible Flashing: Use one of the following unless otherwise indicated:

1. Copper-Laminated Flashing: 7-oz./sq. ft. copper sheet bonded between 2 layers of glass-fiber cloth. Use only where flashing is fully concealed in masonry.
   
a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   1) Dayton Superior Corporation, Dur-O-Wal Division; Copper Fabric Thru-Wall Flashing.
   2) Hohmann & Barnard, Inc.; H & B C-Fab Flashing.
   3) Phoenix Building Products; Type FCC-Fabric Covered Copper.

2. Rubberized-Asphalt Flashing: Composite flashing product consisting of a pliable, adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of not less than 0.040 inch.
   
a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   1) Carlisle Coatings & Waterproofing; CCW-705-TWF Thru-Wall Flashing.
   2) Dayton Superior Corporation, Dur-O-Wal Division; Dur-O-Barrier Thru-Wall Flashing.
   4) Heckmann Building Products Inc.; No. 82 Rubberized-Asphalt Thru-Wall Flashing.
b. Accessories: Provide preformed corners, end dams, other special shapes, and seaming materials produced by flashing manufacturer.

C. Application: Unless otherwise indicated, use the following:

1. Where flashing is indicated to receive counter flashing, use metal flashing.
2. Where flashing is indicated to be turned down at or beyond the wall face, use metal flashing.
3. Where flashing is partly exposed and is indicated to terminate at the wall face, use metal flashing with a drip edge or flexible flashing with a metal drip edge.
4. Where flashing is fully concealed, use metal flashing or flexible flashing.

D. Solder and Sealants for Sheet Metal Flashings: As specified in Section 076200 "Sheet Metal Flashing and Trim."

1. Elastomeric Sealant: ASTM C 920, chemically curing urethane, polysulfide or silicone sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

E. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

2.7 MASONRY CLEANERS

A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Diedrich Technologies, Inc.
   b. ProSoCo, Inc.

2.8 MORTAR MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.

1. Do not use calcium chloride in mortar.
2. Use portland cement-lime mortar unless otherwise indicated.
3. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.

B. Pre-blended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a pre-blended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide type O at limestone and limestone abutting brick unless another type is indicated (see existing mortar testing section 040120). Type N at areas exclusively brick, with exposure to weathering, unless another type is indicated (see existing mortar testing section 040120).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.

B. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

C. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.

1. Mix units from several pallets or cubes as they are placed.

D. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.

E. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.
3.3 TOLERANCES

A. Dimensions and Locations of Elements:

1. For dimensions in cross section or elevation do not vary by more than plus 1/2 inch or minus 1/4 inch.
2. For location of elements in plan do not vary from that indicated by more than plus or minus 1/2 inch.
3. For location of elements in elevation do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls do not vary from level by more than 1/4 inch in 10 feet, or 1/2 inch maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
5. For lines and surfaces do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, or 1/2 inch maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch; do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
2. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch.
3. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch from one masonry unit to the next.

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in **common bond pattern indicated on Drawings;** do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.

C. Stopping and Resuming Work: Stop work by racking back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

E. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

3.5 MORTAR BEDDING AND JOINTING

A. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

3.6 ANCHORING MASONRY VENEERS

A. Anchor masonry veneers to concrete masonry unit backup with seismic masonry-veneer anchors to comply with the following requirements:

1. Fasten screw-attached anchors with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
2. Insert slip-in anchors in metal studs as sheathing is installed. Provide one anchor at each stud in each horizontal joint between sheathing boards.
3. Embed tie sections connector sections and continuous wire in masonry joints. Provide not less than 2 inches of air space between back of masonry veneer and face of sheathing.
4. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
5. Space anchors as indicated, but not more than 18 inches o.c. vertically and 24 inches o.c. horizontally, with not less than 1 anchor for each 2 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 8 inches around perimeter.
3.7 EXPANSION JOINTS

A. General: Install expansion joint materials in unit masonry as masonry progresses. Do not allow materials to span expansion joints without provision to allow for in-plane wall or partition movement.

B. Form expansion joints in brick as follows:

1. Build flanges of metal expansion strips into masonry. Lap each joint 4 inches in direction of water flow. Seal joints below grade and at junctures with horizontal expansion joints if any.
2. Build flanges of factory-fabricated, expansion-joint units into masonry.
3. Build in compressible joint fillers where indicated.
4. Form open joint full depth of brick wythe and of width indicated, but not less than 3/8 inch for installation of sealant and backer rod specified in Section 079200 "Joint Sealants."

3.8 LINTELS

A. Install steel lintels where indicated or at openings or penetrations in load-bearing walls.

B. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

3.9 FLASHING, WEEP HOLES, CAVITY DRAINAGE, AND VENTS

A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated.

B. Install flashing as follows unless otherwise indicated:

1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
2. At masonry-veneer walls, extend flashing through veneer, across air space behind veneer, and up face of sheathing at least 8 inches; with upper edge tucked under building paper or building wrap, lapping at least 4 inches.
3. At lintels and shelf angles, extend flashing a minimum of 6 inches into masonry at each end. At heads and sills, extend flashing 6 inches at ends and turn up not less than 2 inches to form end dams.
4. Interlock end joints of ribbed sheet metal flashing by overlapping ribs not less than 1-1/2 inches or as recommended by flashing manufacturer, and seal lap with elastomeric sealant complying with requirements in Section 079200 "Joint Sealants" for application indicated.
5. Install metal drip edges and sealant stops with ribbed sheet metal flashing by interlocking hemmed edges to form hooked seam. Seal seam with elastomeric sealant complying with requirements in Section 079200 "Joint Sealants" for application indicated.

6. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall and adhere flexible flashing to top of metal drip edge.

7. Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall and adhere flexible flashing to top of metal flashing termination.

8. Cut flexible flashing off flush with face of wall after masonry wall construction is completed.

C. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.

D. Install weep holes in head joints in exterior wythes of first course of masonry immediately above embedded flashing and as follows:

1. Use specified weep/vent products to form weep holes.
2. Space weep holes 24 inches o.c. unless otherwise indicated.
3. Trim wicking material flush with outside face of wall after mortar has set.

E. Place pea gravel in cavities as soon as practical to a height equal to height of first course above top of flashing, but not less than 2 inches to maintain drainage.

F. Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.

G. Install vents in head joints in exterior wythes at spacing indicated. Use specified weep/vent products to form vents.

1. Close cavities off vertically and horizontally with blocking in manner indicated. Install through-wall flashing and weep holes above horizontal blocking.

3.10 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform tests and inspections. Retesting of materials that fail to meet specified requirements shall be done at Contractor's expense.

B. Inspections: Level 1 special inspections according to the "International Building Code."

1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.

C. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.
3.11 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, 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, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
   1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
   2. Test cleaning methods on sample wall panel; leave one-half of panel un-cleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
   3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
   4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
   5. Clean brick by bucket-and-brush hand-cleaning method described in "BIA Technical Notes 20."
   6. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
   7. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.
   8. Clean stone trim to comply with stone supplier's written instructions.
   9. Clean limestone units to comply with recommendations in ILI's "Indiana Limestone Handbook."

3.12 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

B. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042113
SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Roof Ladders

B. Products furnished, but not installed, under this Section:

1. Loose steel lintels.
2. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
3. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.

C. Related Sections:

1. Section 033000 "Cast-in-Place Concrete" for installing anchor bolts, steel pipe sleeves, slotted-channel inserts, wedge-type inserts, and other items cast into concrete.
2. Section 042200 "Concrete Unit Masonry" for installing loose lintels, anchor bolts, and other items built into unit masonry.

1.3 PERFORMANCE REQUIREMENTS

A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

B. Steel Fabricated Pipe Railings:

1. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:
a. Steel: 72 percent of minimum yield strength.

2. Structural Performance: Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
   a. Handrails and Top Rails of Guards:
      1) Uniform load of 50 lbf/ft. applied in any direction.
      2) Concentrated load of 200 lbf applied in any direction.
      3) Uniform and concentrated loads need not be assumed to act concurrently.
   b. Infill of Guards:
      1) Concentrated load of 50 lbf applied horizontally on an area of 1sq. ft.
      2) Infill load and other loads need not be assumed to act concurrently.

C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.4 ACTION SUBMITTALS

A. Product Data: For the following:
   1. Paint products.
   2. Grout.

B. Shop Drawings: Show fabrication and installation details for metal fabrications.
   1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified professional engineer.

B. Welding certificates.

C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.

1.6 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
B. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
3. AWS D1.6, "Structural Welding Code - Stainless Steel."

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

1.8 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages and steel weld plates and angles for casting into concrete. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.2 FERROUS METALS

A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
B. Steel Tubing: ASTM A 500, cold-formed steel tubing.
C. Steel Pipe: ASTM A 53/A 53M, standard weight (Schedule 40) unless otherwise indicated.

2.3 FASTENERS

A. General: Unless otherwise indicated, provide Type 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or
ASTM F 1941, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.

B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A; with hex nuts, ASTM A 563; and, where indicated, flat washers.

C. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593; with hex nuts, ASTM F 594; and, where indicated, flat washers.

D. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.
   1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

E. Eyebolts: ASTM A 489.

F. Machine Screws: ASME B18.6.3.

G. Lag Screws: ASME B18.2.1.

H. Wood Screws: Flat head, ASME B18.6.1.


K. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

L. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.

2.4 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
   1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

C. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.
D. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

E. Non-shrink, Metallic Grout: Factory-packaged, ferrous-aggregate grout complying with ASTM C 1107, specifically recommended by manufacturer for heavy-duty loading applications.

F. Non-shrink, Nonmetallic Grout: Factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

G. Concrete: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi.

2.5 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. 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.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously to comply with the following:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

2.6 METAL LADDERS

A. General:
   1. Comply with ANSI A14.3 unless otherwise indicated.

B. Steel Ladders:
   1. Space siderails 18 inches apart unless otherwise indicated.
   2. Siderails: Continuous, 1/2-by-2-1/2-inch steel flat bars (unless otherwise indicated on drawing), with eased edges.
   3. Rungs: 3/4-inch min.-diameter steel bars.
   4. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
   5. Provide nonslip surfaces on top of each rung, either by coating rung with aluminum-oxide granules set in epoxy-resin adhesive or by using a type of manufactured rung filled with aluminum-oxide grout.
   6. Support each ladder at top and bottom and not more than 60 inches o.c. (or as indicated on drawings) with welded or bolted steel brackets.
   7. Galvanize exterior ladders, including brackets and fasteners.

2.7 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

   1. Fabricate units from slotted channel framing where indicated.
   2. Furnish inserts for units installed after concrete is placed.

C. Galvanize miscellaneous framing and supports where indicated.

D. Prime miscellaneous framing and supports with zinc-rich primer where indicated.
2.8 SHELF ANGLES

A. Fabricate shelf angles from steel angles of sizes indicated and for attachment to concrete framing. Provide horizontally slotted holes to receive 3/4-inch bolts, spaced not more than 6 inches from ends and 24 inches o.c., unless otherwise indicated.

1. Provide mitered and welded units at corners.
2. Provide open joints in shelf angles at expansion and control joints. Make open joint approximately 2 inches larger than expansion or control joint.

B. For cavity walls, provide vertical channel brackets to support angles from backup masonry and concrete.

C. Galvanize shelf angles located in exterior walls.

D. Furnish wedge-type concrete inserts, complete with fasteners, to attach shelf angles to cast-in-place concrete.

2.9 LOOSE BEARING AND LEVELING PLATES

A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

B. Galvanize plates.

2.10 LOOSE STEEL LINTELS

A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.

B. Size loose lintels to provide bearing length at each side of openings equal to 1/12 of clear span but not less than 8 inches unless otherwise indicated.

C. Hot-dip galvanize loose steel lintels located in exterior walls.

2.11 STEEL WELD PLATES AND ANGLES

A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.
2.12 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish metal fabrications after assembly.

C. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.13 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
   1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
   2. Hot-dip galvanize all items that are located outside of the building envelope (defined as outside of the weather barrier or roofing).

B. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.

C. Preparation for Shop Priming: Prepare surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
   3. Other Items: SSPC-SP 3, "Power Tool Cleaning."

D. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
   1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment,
and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:

1. Cast Aluminum: Heavy coat of bituminous paint.
2. Extruded Aluminum: Two coats of clear lacquer.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers’ written instructions and requirements indicated on Shop Drawings.

3.3 INSTALLING BEARING AND LEVELING PLATES


B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with grout.
1. Use non-shrink grout, either metallic or nonmetallic, in concealed locations where not exposed to moisture; use non-shrink, nonmetallic grout in exposed locations unless otherwise indicated.

2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.4 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

  1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 099123 "Painting."

C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 055000
SECTION 061323 - HEAVY TIMBER CONSTRUCTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. This project may require extended work hours in order to meet the completion date. See Specification Section 00210 for Phasing and Schedule Requirements.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes framing using timbers.

B. Section is reserved in the event of a wood member, in the existing southwest gable, requiring replacement. Wood repairs to the southwest gable are shown on 4/A2.6.

C. Related Sections:
   1. Section 061000 "Rough Carpentry" for dimension lumber items associated with heavy timber construction.

1.3 DEFINITIONS

A. Timbers: Lumber of 5 inches nominal or greater in least dimension.

B. Inspection agencies, and the abbreviations used to reference them, include the following:
   2. NHLA - National Hardwood Lumber Association.
   3. NLGA - National Lumber Grades Authority.
   4. SPIB - Southern Pine Inspection Bureau.
   5. WCLIB - West Coast Lumber Inspection Bureau.
   6. WWPA - Western Wood Products Association.

1.4 ACTION SUBMITTALS

A. Product Data: For preservative-treated wood products and timber connectors.
1. For preservative-treated wood products, include chemical treatment manufacturer's written instructions for handling, storing, installing, and finishing treated material.
2. For timber connectors, include installation instructions.

B. Shop Drawings: For heavy timber construction. Show layout, dimensions of each member, and details of connections.

C. Samples: Not less than 5 inches wide by 24 inches long, showing the range of variation to be expected in appearance, including surface texture, of wood products.

1.5 INFORMATIONAL SUBMITTALS

A. Material Certificates:
   1. For heavy timber construction specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by ALSC's Board of Review.
   2. For preservative-treated wood products. Indicate type of preservative used and net amount of preservative retained. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

B. Certificates of Inspection: Issued by lumber grading agency for exposed timber not marked with grade stamp.

1.6 QUALITY ASSURANCE


1.7 DELIVERY, STORAGE, AND HANDLING

A. Schedule delivery of heavy timber construction to avoid extended on-site storage and to avoid delaying the Work.

B. Store materials under cover and protected from weather and contact with damp or wet surfaces. Provide for air circulation within and around stacks and under temporary coverings.

PART 2 - PRODUCTS

2.1 TIMBER

A. General: Comply with DOC PS 20 and with grading rules of lumber grading agencies certified by ALSC's Board of Review as applicable.
1. Factory mark each item of timber with grade stamp of grading agency.
2. For exposed timber indicated to receive a stained or natural finish, apply grade stamps to surfaces that will not be exposed to view, or omit grade stamps and provide certificates of grade compliance issued by grading agency.

B. Timber Species and Grade: Any species and grade that, for moisture content provided, complies with required structural properties.

   1. Allowable Stress Ratings for 12-Inch Nominal Depth: (reserved, if required to be determined)

C. Moisture Content: Provide timber with 19 percent maximum moisture content at time of dressing.

D. Dressing: Provide timber that is rough sawn (Rgh) unless otherwise indicated.

E. End Sealer: Manufacturer’s standard, transparent, colorless wood sealer that is effective in retarding the transmission of moisture at cross-grain cuts and is compatible with indicated finish.

F. Penetrating Sealer: Manufacturer’s standard, transparent, penetrating wood sealer that is compatible with indicated finish.

G. Low-Emitting Materials: Sealers shall comply with the testing and product requirements of the California Department of Health Services’ “Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers.”

2.2 PRESERVATIVE TREATMENT

A. Pressure treat timber with waterborne preservative according to AWPA C15 requirements for "sawn building poles and posts as structural members."

   1. Timber that is not in contact with the ground and is continuously protected from liquid water may be treated with inorganic boron (SBX) according to AWPA C31 instead of AWPA C15.
   2. Treatment with CCA shall include post-treatment fixation process.

B. Pressure treat poles with waterborne preservative to comply with AWPA C4.

   1. Treatment with CCA shall include post-treatment fixation process.

C. Preservative Chemicals: Acceptable to authorities having jurisdiction.

   1. Do not use chemicals containing arsenic or chromium.

D. Use process that includes water-repellent treatment.
E. Use process that does not include water repellents or other substances that might interfere with application of indicated finishes.

F. After treatment, re-dry timber to 19 percent maximum moisture content.

G. Mark treated timber with treatment quality mark of an inspection agency approved by ALSC's Board of Review.

1. For exposed items indicated to receive a stained or natural finish, mark each piece on surface that will not be exposed or omit marking and provide certificates of treatment compliance issued by inspection agency.

H. Application: Treat items indicated on Drawings and the following:

1. Sills and similar members in contact with masonry or concrete.
2. Timber framing members less than 18 inches above grade.

2.3 TIMBER CONNECTORS

A. General: Unless otherwise indicated, fabricate from the following materials:

1. Structural-steel shapes, plates, and flat bars complying with ASTM A 36/A 36M.
2. Round steel bars complying with ASTM A 575, Grade M 1020.
3. Hot-rolled steel sheet complying with ASTM A 1011/A 1011M, Structural Steel, Type SS, Grade 33.
4. Stainless-steel plate and flat bars complying with ASTM A 666, Type 316.
5. Stainless-steel bars and shapes complying with ASTM A 276, Type 316.

B. Fabricate beam hangers from steel with 0.179-inch (4.6-mm) stirrups and 0.239-inch (6-mm) top plates.

C. Fabricate tie rods from round steel bars with upset threads connected with forged-steel turnbuckles complying with ASTM A 668/A 668M.

D. Provide bolts, 3/4 inch (19 mm) unless otherwise indicated, complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); provide nuts complying with ASTM A 563 (ASTM A 563M); and, where indicated, provide flat washers.

E. Finish steel assemblies and fasteners with rust-inhibitive primer, 2-mil dry film thickness.

F. Hot-dip galvanize steel assemblies and fasteners after fabrication to comply with ASTM A 123/A 123M or ASTM A 153/A 153M.
2.4 FABRICATION

A. Camber: Fabricate horizontal members and inclined members with a slope of less than 1:1, with natural convex bow (crown) up, to provide camber.

B. Shop fabricate members by cutting and restoring exposed surfaces to match specified surfacing. Finish exposed surfaces to remove planing or surfacing marks, and to provide a finish equivalent to that produced by machine sanding with No. 120 grit sandpaper.

C. Predrill for fasteners and assembly of units.

D. Where preservative-treated members are indicated, fabricate (cut, drill, surface, and sand) before treatment to greatest extent possible. Where fabrication must be done after treatment, apply a field-treatment preservative to comply with AWPA M4.

   1. Use inorganic boron (SBX) treatment for members not in contact with the ground and continuously protected from liquid water.
   2. Use copper naphthenate treatment for members in contact with the ground or not continuously protected from liquid water.

E. Coat crosscuts with end sealer.

F. Seal Coat: After fabricating and surfacing each unit, apply a saturation coat of penetrating sealer on surfaces of each unit except for treated wood where the treatment included a water repellent.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Erect heavy timber construction true and plumb. Provide temporary bracing to maintain lines and levels until permanent supporting members are in place.

   1. Install heavy timber construction to comply with Shop Drawings.
   2. Install horizontal and sloping members with crown edge up and provide not less than 4 inches of bearing on supports. Provide continuous members unless otherwise indicated; tie together over supports if not continuous.
   3. Handle and temporarily support heavy timber construction to prevent surface damage, compression, and other effects that might interfere with indicated finish.

B. Framing Built into Masonry: Provide 1/2-inch clearance at tops, sides, and ends of members built into masonry, bevel cut ends 3 inches; do not embed more than 4 inches unless otherwise indicated.

C. Cutting: Avoid extra cutting after fabrication. Where field fitting is unavoidable, comply with requirements for shop fabrication.
D. Fit members by cutting and restoring exposed surfaces to match specified surfacing. Predrill for fasteners and assembly of units.

1. Finish exposed surfaces to remove planning or surfacing marks, and to provide a finish equivalent to that produced by machine sanding with No. 120 grit sandpaper.
2. Coat crosscuts with end sealer.
3. Where preservative-treated members must be cut during erection, apply a field-treatment preservative to comply with AWPA M4.
   a. Use inorganic boron (SBX) treatment for members not in contact with the ground and continuously protected from liquid water.
   b. Use copper naphthenate treatment for members in contact with the ground or not continuously protected from liquid water.

E. Install timber connectors as indicated.

1. Unless otherwise indicated, install bolts with same orientation within each connection and in similar connections.
2. Install bolts with orientation as indicated or, if not indicated, as directed by Architect.

3.2 ADJUSTING

A. Repair damaged surfaces and finishes after completing erection. Replace damaged heavy timber construction if repairs are not approved by Architect.

END OF SECTION 061323
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. This project may require extended work hours in order to meet the completion date. See Specification Section 00210 for Phasing and Schedule Requirements.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Exterior standing and running trim.
2. Shop priming of wood trim.
3. Shop finishing of wood trim.

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for wood furring, blocking, and shims required for installing wood trim and concealed within other construction before wood trim installation.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product, including panel products, fire-retardant-treated materials and finishing materials and processes.

1. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.

B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

1. Show details full size.
2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
3. Apply WI Certified Compliance Program label to Shop Drawings.
4. Apply AWI Quality Certification Program label to Shop Drawings.

C. Samples for Initial Selection:
1. Shop-applied transparent finishes.
2. Shop-applied opaque finishes.

D. Samples for Verification:
   1. Lumber for transparent finish, not less than 5 inches wide by 12 inches long for each species and cut, finished on one side and one edge.
   2. Lumber and panel products with shop-applied opaque finish, 5 inches wide by 12 inches long for lumber and 12 by 12 inches for panels, for each finish system and color, with one-half of exposed surface finished.

1.4 INFORMATIONAL SUBMITTALS
   A. Qualification Data: For Installer and/or fabricator.
   B. Product Certificates: For each type of product.
   C. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.
   D. Evaluation Reports: For fire-retardant-treated materials, from ICC-ES.

1.5 QUALITY ASSURANCE
   A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
   B. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.
   C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
      1. Build mockups of typical wood trim as shown on Drawings.
      2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING
   A. Do not deliver wood trim until operations that could damage wood trim have been completed in installation areas. If wood trim must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.
1.7 FIELD CONDITIONS

A. Weather Limitations for Exterior Work: Proceed with installation of exterior wood trim only when existing and forecasted weather conditions permit work to be performed and at least one coat of specified finish to be applied without exposure to rain, snow, or dampness.

B. Environmental Limitations for Interior Work: Do not deliver or install interior wood trim until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

C. Environmental Limitations for Interior Work: Do not deliver or install interior wood trim until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 17 and 50 percent during the remainder of the construction period.

1.8 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that wood trim can be supported and installed as indicated.

PART 2 - PRODUCTS

2.1 WOOD TRIM, GENERAL

A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of wood trim indicated for construction, finishes, installation, and other requirements.

1. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with those selections and requirements in addition to the quality standard.

2.2 EXTERIOR STANDING AND RUNNING TRIM FOR OPAQUE FINISH

A. Grade: Premium

B. Wood Species: Any closed-grain hardwood.

2.3 INTERIOR STANDING AND RUNNING TRIM FOR OPAQUE FINISH

A. Grade: Premium
B. Wood Species: Any closed-grain hardwood.

2.4 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of wood trim and quality grade specified unless otherwise indicated.

1. Do not use plain-sawn softwood lumber with exposed, flat surfaces more than 3 inches wide.
2. Wood Moisture Content for Exterior Materials: 7 to 12 percent.
3. Wood Moisture Content for Interior Materials: 4 to 9 percent.

B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of wood trim and quality grade specified unless otherwise indicated.

1. Medium-Density Fiberboard: ANSI A208.2, Grade 130, made with binder containing no urea formaldehyde.
2. Particleboard: ANSI A208.1, Grade M-2, made with binder containing no urea formaldehyde. (Grade M-2-Exterior Glue).
4. Thermoset Decorative Panels: Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of NEMA LD 3, Grade VGL, for test methods 3.3, 3.4, 3.6, 3.8, and 3.10.

C. Water-Repellent Preservative Treated Materials: Comply with AWPA N1 (dip, spray, flood, or vacuum-pressure treatment) for exterior wood trim indicated to receive water-repellent preservative treatment.

1. Preservative Chemicals: 3-iodo-2-propynyl butyl carbamate (IPBC), combined with an insecticide containing chloropyrifos (CPF).
2. Use chemical formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants in solution to distinguish treated material from untreated material.
3. Extent of Water-Repellent Preservative Treatment: Treat all exterior wood trim unless otherwise indicated.

2.5 FIRE-RETARDANT-TREATED MATERIALS

A. Fire-Retardant-Treated Materials, General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
1. Use treated materials that comply with requirements of referenced woodworking standard. Do not use materials that are warped, discolored, or otherwise defective.
2. Use fire-retardant-treatment formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants to distinguish treated materials from untreated materials.
3. Identify fire-retardant-treated materials with appropriate classification marking of qualified testing agency in the form of removable paper label or imprint on surfaces that will be concealed from view after installation.

B. Fire-Retardant-Treated Lumber: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.

1. For exterior applications, use materials that comply with testing requirements after being subjected to accelerated weathering according to ASTM D 2898.
2. Kiln dry lumber after treatment to a maximum moisture content of 19 percent.
3. For items indicated to receive a stained or natural finish, use organic resin chemical formulation.
4. Mill lumber after treatment within limits set for wood removal that do not affect listed fire-test-response characteristics, using a woodworking shop certified by testing and inspecting agency.
5. Mill lumber before treatment and implement special procedures during treatment and drying processes that prevent lumber from warping and developing discolorations from drying sticks or other causes, marring, and other defects affecting appearance of treated woodwork.

2.6 MISCELLANEOUS MATERIALS

A. Exterior Blocking, Shims, and Nailers: Softwood or hardwood lumber, pressure-preservative treated, kiln dried to less than 15 percent moisture content.

1. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC3b.
   a. Kiln dry lumber after treatment to a maximum moisture content of 19 percent.
   b. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
   c. Mark lumber with treatment quality mark of an inspection agency approved by the American Lumber Standards Committee's (ALSC) Board of Review.

B. Interior Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.

C. Nails for Exterior Use: hot-dip galvanized or stainless steel.

D. Screws for Exterior Use: hot-dip galvanized or stainless steel.
E. Provide self-drilling screws for metal-framing supports, as recommended by metal-framing manufacturer.

F. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

2.7 FABRICATION

A. Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.

B. Fabricate wood trim to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
   1. Edges of Solid-Wood (Lumber) Members: 1/16 inch unless otherwise indicated.

C. Backout or groove backs of flat trim members and kerf backs of other wide, flat members except for members with ends exposed in finished work.

D. Assemble casings in shop except where shipping limitations require field assembly.

E. Assemble moldings in shop to maximum extent possible. Miter corners in shop and prepare for field assembly with bolted fittings designed to pull connections together.

2.8 SHOP PRIMING

A. Exterior Wood Trim for Opaque Finish: Shop prime with one coat of wood primer specified in Section 099113 "Exterior Painting."

B. Interior Wood Trim for Opaque Finish: Shop prime with one coat of wood primer specified in Section 099123 "Interior Painting."

C. Preparations for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing wood trim, as applicable to each unit of work.
   1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of wood trim. **Apply two coats to surfaces installed in contact with concrete or masonry and to end-grain surfaces.**

2.9 SHOP FINISHING

A. General: Finish wood trim at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.
B. General: Drawings indicate items that are required to be shop finished. Finish such items at fabrication shop as specified in this Section. Refer to Section 099100 “Painting” for field finishing wood trim not indicated to be shop finished.

C. Finish Materials: Use finish materials that meet the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

D. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing wood trim, as applicable to each unit of work.

1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of wood trim. Apply two coats to end-grain surfaces.

E. Opaque Finish for Exterior Trim: Comply with Section 099100 "Painting."

PART 3 - EXECUTION

3.1 PREPARATION

A. Before installation, condition wood trim to average prevailing humidity conditions in installation areas.

B. Before installing architectural wood trim, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

A. Grade: Install wood trim to comply with same grade as item to be installed.

B. Assemble wood trim and complete fabrication at Project site to the extent that it was not completed in the shop.

C. Install wood trim level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.

D. Scribe and cut wood trim to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

E. Fire-Retardant-Treated Wood: Handle, store, and install fire-retardant-treated wood to comply with chemical treatment manufacturer's written instructions, including those for adhesives used to install woodwork.

F. Preservative-Treated Wood: Where cut or drilled in field, treat cut ends and drilled holes according to AWPA M4.
G. Anchor wood trim to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork.

1. For shop-finished items, use filler matching finish of items being installed.

H. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible. Do not use pieces less than 36 inches long except where shorter single-length pieces are necessary. Scarf running joints and stagger in adjacent and related members.

1. Fill gaps, if any, between top of base and wall with plastic wood filler; sand smooth; and finish same as wood base if finished.
2. Install standing and running trim with no more variation from a straight line than 1/8 inch in 96 inches.

I. Touch up finishing work specified in this Section after installation of wood trim. Fill nail holes with matching filler where exposed.

1. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are applied in shop.

3.3 ADJUSTING AND CLEANING

A. Repair damaged and defective wood trim, where possible, to eliminate functional and visual defects; where not possible to repair, replace wood trim. Adjust joinery for uniform appearance.

B. Clean wood trim on exposed and semi-exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 064600
SECTION 068000 – EXTERIOR WOOD REPAIR/RESTORATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. This project may require extended work hours in order to meet the completion date. See Specification Section 00210 for Phasing and Schedule Requirements.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY OF WORK

A. Repair rot damaged, or missing wood in existing windows as shown in drawings and photographs.

B. Quality Assurance

1. Contractor shall have minimum 5 years of experience with work of similar scope and nature.

C. Products


1.3 EXECUTION

A. Visually inspect entire wood for signs of decay and deterioration. Thoroughly test wood for physical decay with ice pick or awl any suspected areas from visual inspection and all the following locations:

1. End grain conditions
2. At door rail and style intersections
3. Areas that abut masonry and concrete
4. Areas of paint deterioration and or deformation.

B. Repair rotted areas. Thoroughly dry wood and remove rot. Use epoxy patching compound per manufacturer’s directions. Sand to a level uniform surface and finish per Section 099100 “Painting”.

C. Replace missing or deteriorated trim pieces as required.
1. Mill new profile per Section 64600 “Wood Trim”
2. Cut to fit, install and putty nail holes
3. Finish per Section 099100 “Painting”

END OF SECTION 068000
SECTION 075419 - POLYVINYL-CHLORIDE (PVC) ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Adhered PVC membrane roofing system.
   2. Mechanically Fastened Roof insulation.

B. Related Sections:
   1. Section 061000 "Rough Carpentry" for wood nailers, curbs, and blocking.
   2. Section 076200 "Sheet Metal Flashing and Trim" for metal roof penetration flashings, flashings, and counterflashings.

1.3 DEFINITIONS

A. Roofing Terminology: See ASTM D 1079 and glossary in NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.

1.4 PERFORMANCE REQUIREMENTS

A. General Performance: Installed membrane roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.

C. Roofing System Design: Provide membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE/SEI 7 and the International Building Code (IBC).
D. FM Approvals Listing: Provide membrane roofing, base flashings, and component materials that comply with requirements in FM Approvals 4450 and FM Approvals 4470 as part of a membrane roofing system, and that are listed in FM Approvals' "RoofNav" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Approvals markings.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work.
   1. Base flashings and membrane terminations.
   2. Tapered insulation, including slopes.
   3. Roof plan showing orientation of steel roof deck and orientation of membrane roofing and fastening spacings and patterns for mechanically fastened membrane roofing.
   4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.

C. Samples for Verification: For the following products:
   1. Sheet roofing, of color specified, including T-shaped side and end lap seam.
   2. Roof insulation.
   3. Walkway pads or rolls.
   4. Metal termination bars.
   5. Six insulation fasteners of each type, length, and finish.
   6. Six roof cover fasteners of each type, length, and finish.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer and manufacturer.

B. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
   1. Submit evidence of compliance with performance requirements.

C. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of membrane roofing system.

D. Research/Evaluation Reports: For components of membrane roofing system, from the ICC-ES.

E. Field quality-control reports.

F. Warranties: Sample of special warranties.
1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing system to include in maintenance manuals.

1.8 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is UL listed and/or FM Approvals approved for membrane roofing system identical to that used for this Project.

B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by membrane roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

C. Source Limitations: Obtain components including roof insulation, fasteners and accessories for membrane roofing system from same manufacturer as membrane roofing or approved by membrane roofing manufacturer.

D. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.

E. Preinstallation Roofing Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture,
approval or listing agency markings, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.10 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.11 WARRANTY

A. Special Warranty: Manufacturer's standard or customized form, without monetary limitation, in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period.

1. Special warranty includes membrane roofing, base flashings, roof insulation, fasteners, roofing accessories, and other components of membrane roofing system.

2. Warranty Period: Ten (10) years from date of Substantial Completion.

B. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section, including all components of membrane roofing system such as membrane roofing, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:

1. Warranty Period: Five (5) years from date of Substantial Completion.
2.1 PVC MEMBRANE ROOFING


1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   b. GAF Materials Corporation.
   c. Sarnafil Inc.
   d. Seeman Corp. Fibertite Roofing Solutions
   e. Versico Inc.

2. Thickness: 60 mils, nominal.
3. Exposed Face Color: White

5. Roofing systems manufactured by others are acceptable provided the roofing system is completely equal in material and warranty conditions and the manufacturer meets the following qualifications as approved by the owner. Additional manufacturer's looking to bid a non-list manufacturer must submit approval documentation a minimum of 10 days prior to bid date.

6. Alternate manufacturers must/have/be:
   a. Specialize in manufacturing the roofing system specified.
   b. Minimum 10 years of experience manufacturing the roofing system specified.
   c. ISO 9002 Certified
   d. Able to provide polyisocyanurate insulation that is produced in their own facilities.

2.2 AUXILIARY MEMBRANE ROOFING MATERIALS

A. General: Auxiliary membrane roofing materials recommended by roofing system manufacturer for intended use, and compatible with membrane roofing.

1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.

B. Sheet Flashing: Manufacturer's standard sheet flashing of same material, type, reinforcement, thickness, and color as PVC sheet membrane.

C. Bonding Adhesive: Manufacturer's standard, water based.

D. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.
E. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer.

F. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, heat weldable walkway rolls and other accessories.

2.3 SUBSTRATE BOARDS
A. Provide substrate boards and related fasteners only if recommended by roofing system, manufacturer for intended use, and compatible with membrane roofing. If roofing manufacturers do not recognize or required substrate boards to be part of their roofing system, they are not required.

2.4 ROOF INSULATION
A. General: Preformed roof insulation boards manufactured or approved by PVC membrane roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated and that produce FM Approvals-approved roof insulation.

B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.

C. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48) unless otherwise indicated.

D. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.5 INSULATION ACCESSORIES
A. General: Furnish roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with membrane roofing.

B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation (and cover boards if required by manufacturer) to substrate, and acceptable to roofing system manufacturer.

C. Cover Board: ASTM C 208, Type II, Grade 2, cellulosic-fiber insulation board, 1/2 inch thick. Install only if required by manufacturer.

D. Fascia: Roofing mfg. to provide weldable, concealed anchor 24ga galvanized steel roof edge trim and splice plates with Kynar 500 finish, color as selected by Architect from full range of manufacturers colors. (VersiTrim 2000 HG or approved equal)
3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:

1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.
2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
3. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Section 053100 "Steel Decking."
4. Verify that minimum concrete drying period recommended by roofing system manufacturer has passed.
5. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
6. Verify that concrete curing compounds that will impair adhesion of roofing components to roof deck have been removed.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.3 SUBSTRATE BOARD

A. Install substrate board with long joints in continuous straight lines, perpendicular to roof slopes with end joints staggered between rows. Tightly butt substrate boards together.

1. Fasten substrate board to top flanges of steel deck according to recommendations in FM Approvals' "RoofNav" and FM Global Loss Prevention Data Sheet 1-29 for specified Windstorm Resistance Classification.
2. Fasten substrate board to top flanges of steel deck to resist uplift pressure at corners, perimeter, and field of roof according to membrane roofing system manufacturers' written instructions.

3.4 INSULATION INSTALLATION

A. Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.

B. Comply with membrane roofing system and insulation manufacturer’s written instructions for installing roof insulation.

C. Install tapered insulation under area of roofing to conform to slopes indicated.

D. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.

  1. Where installing composite and noncomposite insulation in two or more layers, install noncomposite board insulation for bottom layer and intermediate layers, if applicable, and install composite board insulation for top layer.

E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

F. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.

  1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.

G. Mechanically Fastened Insulation: Install each layer of insulation and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.

  1. Fasten insulation according to requirements in FM Approvals' "RoofNav" for specified Windstorm Resistance Classification.

  2. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof.

H. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction. Loosely butt cover boards together and fasten to roof deck.

  1. Fasten cover boards according to requirements in FM Approvals' "RoofNav" for specified Windstorm Resistance Classification.

  2. Fasten cover boards to resist uplift pressure at corners, perimeter, and field of roof.
3.5 ADHERED MEMBRANE ROOFING INSTALLATION

A. Adhere membrane roofing over area to receive roofing and install according to membrane roofing system manufacturer's written instructions.
   1. Install sheet according to ASTM D 5036.

B. Start installation of membrane roofing in presence of membrane roofing system manufacturer's technical personnel.

C. Accurately align membrane roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

D. Bonding Adhesive: Apply to substrate and underside of membrane roofing at rate required by manufacturer and allow to partially dry before installing membrane roofing. Do not apply to splice area of membrane roofing.

E. In addition to adhering, mechanically fasten membrane roofing securely at terminations, penetrations, and perimeter of roofing.

F. Apply membrane roofing with side laps shingled with slope of roof deck where possible.

G. Seams: Clean seam areas, overlap membrane roofing, and hot-air weld side and end laps of membrane roofing and sheet flashings according to manufacturer's written instructions to ensure a watertight seam installation.
   1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet membrane.
   2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
   3. Repair tears, voids, and lapped seams in roofing that does not comply with requirements.

H. Spread sealant bed over deck drain flange at roof drains and securely seal membrane roofing in place with clamping ring.

I. Install membrane roofing and auxiliary materials to tie in to existing roofing to maintain weathertightness of transition and to not void warranty for existing membrane roofing system.

3.6 BASE FLASHING INSTALLATION

A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.

B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply to seam area of flashing.
C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.

D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.

E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.7 FIELD QUALITY CONTROL

A. Testing Agency: [Owner will engage] [Engage] a qualified testing agency to perform tests and inspections.

B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.

C. Repair or remove and replace components of membrane roofing system where inspections indicate that they do not comply with specified requirements.

D. Additional inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.8 PROTECTING AND CLEANING

A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements; repair substrates; and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

3.9 ROOFING INSTALLER’S WARRANTY

A. WHEREAS <Insert name> of <Insert address>, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

1. Owner:
2. Address:
3. Building Name/Type: Address:
4. Area of Work:
5. Acceptance Date: <Insert date>.
7. Expiration Date: <Insert date>.

B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

D. This Warranty is made subject to the following terms and conditions:
   1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
      a. Lightning;
      b. Peak gust wind speed exceeding 55 mph;
      c. Fire;
      d. Failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
      e. Faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
      f. Vapor condensation on bottom of roofing; and
      g. Activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
   2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
   3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
   4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
   5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally
specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.

6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.

7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner’s General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this <Insert day> day of <Insert month>, <Insert year>.

1. Authorized Signature: <Insert signature>.
2. Name: <Insert name>.
3. Title: <Insert title>.

END OF SECTION 075419
SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. This project may require extended work hours in order to meet the completion date. See Specification Section 00210 for Phasing and Schedule Requirements.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Manufactured Products:
   a. Manufactured through-wall flashing and counterflashing.
   b. Manufactured reglets and counterflashing.

2. Formed Products:
   a. Formed low-slope roof sheet metal fabrications.
   b. Formed wall sheet metal fabrications.

B. Related Sections:

1. Section 061000 "Rough Carpentry” for wood nailers, curbs, and blocking.
2. Section 075419 “Polyvinyl-Chloride (PVC) Roofing” for installing sheet metal flashing and trim integral with roofing.

1.3 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies as indicated shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Thermal Movements: Provide sheet metal flashing and trim that allows for thermal movements from ambient and surface temperature changes.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

B. Shop Drawings: Show fabrication and installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work. Include the following:

1. Identification of material, thickness, weight, and finish for each item and location in Project.
2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
3. Details for joining, supporting, and securing sheet metal flashing and trim, including layout of fasteners, cleats, clips, and other attachments. Include pattern of seams.
4. Details of termination points and assemblies, including fixed points.
5. Details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction.
6. Details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counter flashings as applicable.
7. Details of special conditions.
8. Details of connections to adjoining work.
9. Detail formed flashing and trim at a scale of not less than 3 inches per 12 inches.

C. Samples for Initial Selection: For each type of sheet metal flashing, trim, and accessory indicated with factory-applied color finishes involving color selection.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:

1. Sheet Metal Flashing: 12 inches long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches long and in required profile. Include fasteners and other exposed accessories.
3. Accessories and Miscellaneous Materials: Full-size Sample.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified fabricator.

B. Warranty: Sample of special warranty.
1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For sheet metal flashing, trim, and accessories to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

B. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.

C. Pre-installation Conference: Conduct conference at project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, Installer, and installers whose work interfaces with or affects sheet metal flashing and trim including installers of roofing materials, roof accessories, unit skylights, and roof-mounted equipment.
2. Review methods and procedures related to sheet metal flashing and trim.
3. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
4. Review special roof details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect sheet metal flashing.
5. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to the extent necessary for the period of sheet metal flashing and trim installation.

1.9 WARRANTY

A. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: Ten (10) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Basis-of-Design Product: Subject to compliance with requirements, provide metal products as manufactured by Firestone Building Products.

B. Other manufacturers seeking approval of their products must comply with requirements of Section 00100 “Instruction to Bidders”, Paragraph 3.3 prior to bidding.

C. Other manufacturers seeking approval of their products must provide a custom match to the basis-of-design color selections prior to bidding.

2.2 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.

B. Metallic-Coated Steel Sheet: Restricted flatness steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
   1. Surface: Smooth, flat finish.
   2. Thickness: 22 gauge

C. Metallic-Coated Steel Sheet: Restricted flatness steel sheet, metallic coated by the hot-dip process and pre-painted by the coil-coating process to comply with ASTM A 755/A 755M.
   1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation; structural quality.
   2. Surface: Smooth, flat.
   3. Thickness: 22 gauge

2.3 UNDERLAYMENT MATERIALS

A. Felt: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, non-perforated.
2.4 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
   a. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.

2. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329 or Series 300 stainless steel.

C. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, non-staining tape 1/2 inch wide and 1/8 inch thick.

D. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

E. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

2.5 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.

1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.

2. Obtain field measurements for accurate fit before shop fabrication.

3. Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.

4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.

B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
C. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

D. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant.

E. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.

F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

G. Fabricate cleats and attachment devices of sizes as recommended by SMACNA's "Architectural Sheet Metal Manual" for application, but not less than thickness of metal being secured.

H. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.

I. Do not use graphite pencils to mark metal surfaces.

2.6 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Roof-Edge Flashing Fascia Cap: Fabricate in minimum 96-inch-long, but not exceeding 10-foot-long, sections. Furnish with 6-inch-wide, joint cover plates.

1. Flashing Height: As shown on Drawings.
2. Joint Style: Butt, with 12-inch-wide, concealed backup plate and 6-inch-wide, exposed cover plates.
3. Fabricate from the following materials:
   a. Fluorocarbon-Coated Galvanized Steel: 0.028 inch thick.

B. Copings: Fabricate in minimum 96-inch-long, but not exceeding 10-foot-long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg. Miter corners, seal, and solder or weld watertight.

1. Coping Height, Width and Profile: As shown on Drawings.
2. Joint Style: Butt, with 12-inch-wide, concealed backup plate and 6-inch-wide, exposed cover plates.
3. Fabricate from the following materials:
   a. Fluorocarbon-Coated Galvanized Steel: 0.040 inch thick.

C. Hanging Gutters: Fabricate to cross section indicated, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch-long sections. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as
gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters.

1. Gutter Style: SMACNA designation “A”
2. Gutter Size: As shown on Drawings.
3. Expansion Joints: Butt type with cover plate.
5. Gutters with Girth up to 15 Inches: Fabricate from the following materials:
   a. Fluorocarbon-Coated Galvanized Steel: 0.040 inch thick.

D. Downspouts: Fabricate rectangular, open-face downspouts complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.

1. Downspout Size: As shown on Drawings.
2. Manufactured Hanger Style: Rear & Side Mounted Pipe-Cleat Style Hanger
3. Fabricate from the following materials:
   a. Fluorocarbon-Coated Galvanized Steel: 0.040 inch thick.

E. Roof and Roof to Wall Transition, Roof to Roof Edge Flashing (Gravel Stop) Transition, and Roof to Roof Edge Flashing (Gravel Stop) and Fascia Cap Transition Expansion-Joint Cover: Fabricate from the following materials:

1. Height and Profile: As shown on Drawings.
2. Fluorocarbon-Coated Galvanized Steel: 0.034 inch thick.

F. Base Flashing: Fabricate from the following materials:

1. Galvanized Steel: 0.028 inch thick.

G. Counter flashing: Fabricate from the following materials:

1. Fluorocarbon-Coated Galvanized Steel: 0.022 inch thick.

H. Flashing Receivers: Fabricate from the following materials:

1. Galvanized Steel: 0.022 inch thick.

I. Roof-Penetration Flashing: Fabricate from the following materials:

1. Fluorocarbon-Coated Galvanized Steel: 0.028 inch thick.

J. Roof-Drain Flashing: Fabricate from the following materials:

1. Copper: 12 oz./sq. ft.
2. Stainless Steel: 0.016 inch thick.
3. Fluorocarbon-Coated Galvanized Steel: 0.015 inch thick.
2.7 WALL SHEET METAL FABRICATIONS

A. Through-Wall Flashing: Fabricate continuous flashings in minimum 96-inch-long, but not exceeding 12-foot-long, sections, under copings, at shelf angles, and where indicated. Fabricate discontinuous lintel, sill, and similar flashings to extend 6 inches beyond each side of wall openings. Form with 2-inch-high, end dams where flashing is discontinuous. Fabricate from the following materials:

1. Stainless Steel: 0.016 inch thick.
2. Zinc-Tin Alloy-Coated Stainless Steel: 0.015 inch thick.

B. Opening Flashings in Frame Construction: Fabricate head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings. Form head and sill flashing with 2-inch-high, end dams. Fabricate from the following materials:

1. Fluorocarbon-Coated Galvanized Steel: 0.022 inch thick.

2.8 FINISHES

A. Coil-Coated or Spray-Applied Kynar 500 Fluorocarbon Resin

1. Color: To match existing. Provide manufacturers standard colors for selection.
2. If supplier does not have a standard color that matches existing, supplier shall provide custom color at no additional charge.
3. Exposed Coil-Coated Finish:
   a. Four-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat and clear coats. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
4. Provide factory applied strippable plastic film for protection during fabrication and installation.
5. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of the Work.

1. Verify compliance with requirements for installation tolerances of substrates.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

B. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

A. General: Install underlayment as indicated on Drawings.

B. Felt Underlayment: Install felt underlayment with adhesive for temporary anchorage to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.

C. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Apply primer if required by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.

3.3 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.

2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

3. Space cleats not more than 12 inches apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.

4. Install exposed sheet metal flashing and trim without oil canning, buckling, and tool marks.

5. Install sealant tape where indicated.

6. Torch cutting of sheet metal flashing and trim is not permitted.

7. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.

1. Coat back side of uncoated aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.

2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene sheet.
C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.

D. Fastener Sizes: Use fasteners of sizes that will penetrate wood sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws and metal decking not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

E. Seal joints as required for watertight construction.
   1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.
   2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

F. Rivets: Rivet joints in uncoated aluminum where indicated and where necessary for strength.

3.4 ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in SMACNA's "Architectural Sheet Metal Manual" and as indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch centers.

C. Copings: Anchor to resist uplift and outward forces according to recommendations in SMACNA's "Architectural Sheet Metal Manual" and as indicated.
   1. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 16-inch centers.
   2. Anchor interior leg of coping with washers and screw fasteners through slotted holes at 24-inch centers.

D. Pipe or Post Counter flashing: Install counter flashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.
E. Counter Flashing: Coordinate installation of counter flashing with installation of base flashing. Insert counter flashing in reglets or receivers and fit tightly to base flashing. Extend counter flashing 4 inches over base flashing. Lap counter flashing joints a minimum of 4 inches and bed with sealant. Secure in a waterproof manner by means of interlocking folded seam or blind rivets and sealant or anchor and washer at 36-inch centers.

F. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with sealant recommended by roofing manufacturer and clamp flashing to pipes that penetrate roof.

3.5 WALL FLASHING INSTALLATION

A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

B. Through-Wall Flashing: Installation of through-wall flashing is specified in Sections 042113 "Brick Masonry" and 042200 "Concrete Unit Masonry."

C. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings.

3.6 MISCELLANEOUS FLASHING INSTALLATION

A. Overhead-Piping Safety Pans: Suspend pans independent from structure above as indicated on Drawings. Pipe and install drain line to plumbing waste or drainage system.

B. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

3.7 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."
3.8 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

C. Clean off excess sealants.

D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturers written installation instructions. On completion of installation, remove unused materials and clean finished surfaces. Maintain in a clean condition during construction.

E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200
SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. This project may require extended work hours in order to meet the completion date. See Specification Section 00210 for Phasing and Schedule Requirements.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Silicone joint sealants.
2. Urethane joint sealants.
3. Latex joint sealants.

B. Related Sections:

1. Section 040120 “Maintenance of unit masonry”
2. Section 040140 “Maintenance of stone assemblies”
3. Section 064600 “Wood trim”
4. Section 088000 "Glazing" for glazing sealants.

1.3 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- wide joints formed between two 6-inch- strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

D. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.

C. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.

E. Preconstruction Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
   1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
   2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

F. Preconstruction Field-Adhesion Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.

G. Field-Adhesion Test Reports: For each sealant application tested.

H. Warranties: Sample of special warranties.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.

C. Product Testing: Test joint sealants using a qualified testing agency.
   1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
   2. Test according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.

D. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

E. Pre-installation Conference: Conduct conference at Project site.
1.6 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.7 WARRANTY

A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Five (5) years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Five (5) years from date of Substantial Completion.

C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by structural settlement or errors attributable to design or construction resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
2. Disintegration of joint substrates from natural causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
B. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.

C. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

D. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

A. Applications:

1. Interior
2. Wet-locations within 5 feet of sinks or plumbing fixtures.
3. On non-pourous surfaces such as tile, glass and metal.

B. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. Dow Corning Corporation; 790
   b. GE Advanced Materials - Silicones; SilPruf LM SCS2700.
   c. Sika Corporation, Construction Products Division; SikaSil-C990.
   d. Tremco Incorporated; Spectrem 1, Spectrem 800.

2.3 URETHANE JOINT SEALANTS

A. Applications:

1. Exterior

B. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
2.4 LATEX JOINT SEALANTS

A. Applications:

1. Interior
2. Non-wet-locations further than 5 feet from sinks or plumbing fixtures.
3. Gap-filler at woodwork, trim, baseboard, etc.
4. Where sealant is required to be painted to match adjacent surfaces.

B. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

1. Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

   a. BASF Building Systems; Sonolac.
   c. Tremco Incorporated; Tremflex 834.

2.5 JOINT SEALANT BACKING

A. General: Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), Type O (open-cell material, Type B (bicellular material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.6 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances
capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

   a. Concrete.
   b. Masonry.
   c. Unglazed surfaces of ceramic tile.
   d. Exterior insulation and finish systems.

3. Remove laitance and form-release agents from concrete.

4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

   a. Metal.
   b. Glass.
   c. Porcelain enamel.
   d. Glazed surfaces of ceramic tile.
3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

   1. Do not leave gaps between ends of sealant backings.
   2. Do not stretch, twist, puncture, or tear sealant backings.
   3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

   1. Place sealants so they directly contact and fully wet joint substrates.
   2. Completely fill recesses in each joint configuration.
   3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

   1. Remove excess sealant from surfaces adjacent to joints.
   2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
   3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193.
   a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

G. Installation of Preformed Silicone-Sealant System: Comply with the following requirements:

1. Apply masking tape to each side of joint, outside of area to be covered by sealant system.
2. Apply silicone sealant to each side of joint to produce a bead of size complying with preformed silicone-sealant system manufacturer's written instructions and covering a bonding area of not less than 3/8 inch. Hold edge of sealant bead 1/4 inch inside masking tape.
3. Within 10 minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.
4. Complete installation of sealant system in horizontal joints before installing in vertical joints. Lap vertical joints over horizontal joints. At ends of joints, cut silicone extrusion with a razor knife.

H. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping. Do not pull or stretch material. Produce seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures, apply heat to sealant in compliance with sealant manufacturer's written instructions.

3.4 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

1. Extent of Testing: Test completed and cured sealant joints as follows:
   a. Perform 10 tests for the first 1000 feet of joint length for each kind of sealant and joint substrate.

   a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

3. Inspect tested joints and report on the following:
   a. Whether sealants filled joint cavities and are free of voids.
b. Whether sealant dimensions and configurations comply with specified requirements.

c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.

4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.

5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

B. Evaluation of Field-Adhesion Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 079200
SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
A. Section includes hollow-metal work.
B. Related Requirements:
   1. Section 087100 "Door Hardware" for door hardware for hollow-metal doors.

1.3 DEFINITIONS
A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.4 COORDINATION
A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.5 PREINSTALLATION MEETINGS
A. Pre-installation Conference: Conduct conference at project site.

1.6 ACTION SUBMITTALS
A. Product Data: For each type of product.
   1. Include construction details, material descriptions, core descriptions, and finishes.
B. Shop Drawings: Include the following:
1. Elevations of each door type.
2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of each different wall opening condition.
6. Details of anchorages, joints, field splices, and connections.
7. Details of accessories.
8. Details of moldings, removable stops, and glazing.
9. Details of conduit and preparations for power, signal, and control systems.

C. Schedule: Provide a schedule of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.

1.7 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each type of hollow-metal door and frame assembly, for tests performed by a qualified testing agency.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use non-vented plastic.

1. Provide additional protection to prevent damage to factory-finished units.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch-high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Amweld International, LLC.
2. Apex Industries, Inc.
3. Ceco Door Products; an Assa Abloy Group company.
4. Curries Company; an Assa Abloy Group company.
5. Republic Doors and Frames.
6. Steelcraft; an Ingersoll-Rand company.

B. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

2.2 INTERIOR DOORS AND FRAMES

A. Construct interior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Commercial Doors and Frames: NAAMM-HMMA 861. At locations indicated in the Door and Frame Schedule.

1. Physical Performance: Level A according to SDI A250.4.
2. Doors:
   a. Type: As indicated in the Door and Frame Schedule.
   b. Thickness: 1-3/4 inches
   c. Face: Uncoated, cold-rolled steel sheet, minimum thickness of 0.042 inch.
   d. Edge Construction: Continuously welded with no visible seam.
   e. Core: Steel stiffened.

3. Frames:
   a. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch door openings 48 inches or less, or window frames; minimum thickness of 0.067 inch for door openings greater than 48 inches.
   b. Construction: Full profile welded.

4. Exposed Finish: Prime & Field Paint as shown on Drawings.

2.3 EXTERIOR HOLLOW-METAL DOORS AND FRAMES

A. Construct exterior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Commercial Doors and Frames: NAAMM-HMMA 861. At locations indicated in the Door and Frame Schedule.

1. Physical Performance: Level A according to SDI A250.4.
2. Doors:
a. Type: As indicated in the Door and Frame Schedule.
b. Thickness: 1-3/4 inches
c. Face: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum G60 paint-grade coating.
d. Edge Construction: Continuously welded with no visible seam.
e. Core: Steel stiffened.
f. Elevation: See Drawings. See Door Schedule.

1) Thermal-Rated Doors: Provide doors fabricated with thermal-resistance value (R-value) of not less than 2.1 deg F x h x sq. ft./Btu when tested according to ASTM C 1363.

3. Frames: (reserved)
a. Materials: Metallic-coated steel sheet, minimum thickness of 0.067 inch, with minimum G60 paint-grade coating.
b. Construction: Full profile welded.

4. Exposed Finish: Prime & Field Paint as shown on Drawings.

2.4 FRAME ANCHORS (reserved)

A. Jamb Anchors:
   1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
   2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
   3. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.
   4. Post-installed Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch, and as follows:
   1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
   2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at finish floor surface.

2.5 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.

D. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.

E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

F. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

G. Grout: ASTM C 476, except with a maximum slump of 4 inches, as measured according to ASTM C 143/C 143M.

H. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

I. Glazing: Comply with requirements in Section 088000 "Glazing."

2.6 FABRICATION

A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Hollow-Metal Doors:

1. Steel-Stiffened Door Cores: Provide minimum thickness 0.026 inch, steel vertical stiffeners of same material as face sheets extending full-door height, with vertical webs spaced not more than 6 inches apart. Spot weld to face sheets no more than 5 inches o.c. Fill spaces between stiffeners with glass- or mineral-fiber insulation.


3. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets.
4. Bottom Edge Closures: Close bottom edges of doors where required for attachment of weather stripping with end closures or channels of same material as face sheets.

5. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.

6. Astragals: Provide overlapping astragal on one leaf of pairs of doors where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.

C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

1. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.

2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

3. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.

4. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.

5. Jamb Anchors: Provide number and spacing of anchors as follows:

   a. Masonry Type: Locate anchors not more than 16 inches from top and bottom of frame. Space anchors not more than 32 inches o.c., to match coursing, and as follows:
      1) Four anchors per jamb from 90 to 120 inches high.
      2) Four anchors per jamb plus one additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.

   b. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
      1) Five anchors per jamb from 90 to 96 inches high.
      2) Five anchors per jamb plus one additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.

6. Head Anchors: Two anchors per head for frames more than 42 inches wide and mounted in metal-stud partitions.

7. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.

   a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.

   b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
D. Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.

E. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.

1. Reinforce doors and frames to receive non-templated, mortised, and surface-mounted door hardware.
2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.

F. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with mitered hairline joints.

1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
4. Provide loose stops and moldings on inside of hollow-metal work.
5. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

2.7 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

2.8 ACCESSORIES

A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

B. Grout Guards: Formed from same material as frames, not less than 0.016 inch thick.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

A. General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.

B. Hollow-Metal Frames: Install hollow-metal frames of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

   a. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.

   b. Install frames with removable stops located on secure side of opening.

   c. Install door silencers in frames before grouting.

   d. Remove temporary braces necessary for installation only after frames have been properly set and secured.
e. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.

f. Field apply bituminous coating to backs of frames that will be filled with grout containing anti-freezing agents.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.

a. Floor anchors may be set with power-actuated fasteners instead of post-installed expansion anchors if so indicated and approved on Shop Drawings.


4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.

5. In-Place Concrete or Masonry Construction: Secure frames in place with post-installed expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.

6. In-Place Metal or Wood-Stud Partitions: Secure slip-on drywall frames in place according to manufacturer's written instructions.

7. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:

a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.

b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.

c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.

d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

C. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Steel Doors:

a. Between Door and Frame Jambs and Head: 1/8 inch plus or minus 1/32 inch.

b. Between Edges of Pairs of Doors: 1/8 inch to 1/4 inch plus or minus 1/32 inch.

c. At Bottom of Door: 5/8 inch or minus 1/32 inch. Coordinate with threshold.

d. Between Door Face and Stop: 1/16 inch to 1/8 inch plus or minus 1/32 inch.

D. Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow-metal manufacturer's written instructions.

1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.
3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow-metal work immediately after installation.

C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

D. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.
SECTION 099123 - PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. This project may require extended work hours in order to meet the completion date. See Specification Section 00210 for Phasing and Schedule Requirements.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. In general, this section includes new finishes on all exposed surfaces within the building, or added to the exterior of the building unless specifically excluded on the drawings or room finish schedule.

B. Section includes surface preparation and the application of paint systems on the following new and existing substrates:

1. Concrete.
2. Concrete masonry units (CMU).
3. Steel.
5. Wood.

C. Section includes surface preparation and application of semi-transparent finishes on new and existing doors, trim, woodwork and casework.

D. Related Requirements:

1. Section 051200 "Structural Steel Framing" for shop priming of metal substrates with primers specified in this Section.
2. Section 055000 "Metal Fabrications" for shop priming of metal substrates with primers specified in this Section.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

B. Samples for Initial Selection: For each type of topcoat product.
C. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.
   1. Submit Samples on rigid backing, 8 inches square.
   2. Step coats on Samples to show each coat required for system.
   3. Label each coat of each Sample.
   4. Label each Sample for location and application area.

1.4 MAINTENANCE MATERIAL SUBMITTALS
A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Paint: Five (5) percent, but not less than 1 gal. of each material and color applied.

1.5 QUALITY ASSURANCE
A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
      a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft..
      b. Other Items: Architect will designate items or areas required.
   2. Final approval of color selections will be based on mockups.
      a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
   3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING
A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
   1. Maintain containers in clean condition, free of foreign materials and residue.
   2. Remove rags and waste from storage areas daily.
1.7 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 85 deg F

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. Diamond Vogel Paints.
   2. PPG Architectural Finishes, Inc.
   4. ICI Paints.
   5. Sherwin-Williams Company (The).

2.2 PAINT, GENERAL

A. Material Compatibility:
   1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
   2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. Colors: As shown on Drawings.

2.3 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
   1. Owner may engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
   2. Testing agency will perform tests for compliance with product requirements.
   3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and
repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.
3. Wood: 15 percent.
4. Gypsum Board: 12 percent.
5. Plaster: 12 percent.

C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

D. Plaster Substrates: Verify that plaster is fully cured.

E. Spray-Textured Ceiling Substrates: Verify that surfaces are dry.

F. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

G. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
   1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer’s written instructions.

E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceed that permitted in manufacturer’s written instructions.

F. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer.

G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

I. Aluminum Substrates: Remove loose surface oxidation.

J. Wood Substrates:
   1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
   2. Sand surfaces that will be exposed to view, and dust off.
   3. Prime edges, ends, faces, undersides, and backsides of wood.
   4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
   1. Use applicators and techniques suited for paint and substrate indicated.
   2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
   3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
   4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

E. DO NOT PAINT Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work unless indicated on drawings.

1. DO NOT Paint the following work where exposed to view:
   a. Telecommunications cables, raceway and other devices:
      1) DO NOT PAINT CABLE - If a cable is inadvertently painted, it shall be hereby defined as damaged. The cable shall be replaced, in its entirety, by the Contractor at their expense.
      2) DO NOT PAINT SURFACE MOUNT RACEWAY OR DEVICE BOXES - The Panduit LDPH10 surface mount raceway and the data termination boxes shall not be painted.
      3) CLEANING NOT ACCEPTABLE - Cleaning of painted cable is not acceptable.
      4) NOTIFICATION - It shall be the responsibility of the Contractor to notify the Architect if any cable is painted. Such notification shall be made within one working day of the occurrence, so that representative of the School District can make assessment of the damage.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.
3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINTING SCHEDULE

A. Concrete Substrates, Nontraffic Surfaces:
   1. Latex System:

B. Clay-Masonry Substrates:
   1. Latex System:

C. CMU Substrates:
   1. Latex System:

D. Steel Substrates:
   1. Alkyd System:
E. Galvanized-Metal Substrates:

1. Latex over Waterborne Primer System:

F. Wood Substrates: Including wood trim, architectural woodwork, doors, wood windows, wood-based panel products, and exposed wood structure.

1. Latex System:

G. Gypsum Board and Plaster Substrates:

1. Latex System (typical walls and ceilings):

2. Epoxy System (typical at wet-locations where indicated on room finish schedule):

H. Spray-Textured Ceiling Substrates:

1. Latex (Flat) System: Spray applied.
   b. Topcoat: DV Elevate Interior Latex Ultra Flat Ceiling Paint.

3.7 Prior to order and installation, the contractor shall verify with the owner whether Semi-Gloss sheen is acceptable or if a Gloss sheen is required.

END OF SECTION 099123
PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. This project may require extended work hours in order to meet the completion date. See Specification Section 00210 for Phasing and Schedule Requirements.
   B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. Section Includes:
      1. Pipe, tube, and fittings.
      2. Specialty pipe fittings.
      3. Encasement for underground metal piping.
   B. Related Sections:
      1. Section 221429 "Sump Pumps" for storm drainage pumps.
      2. Section 334100 "Storm Utility Drainage Piping" for storm drainage piping outside the building.

1.3 ACTION SUBMITTALS
   A. Product Data: For each type of product indicated.

1.4 QUALITY ASSURANCE
   A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS
   A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.
PART 3 - EXECUTION

3.1 PIPING INSTALLATION

A. Install piping free of sags and bends.

B. Install fittings for changes in direction and branch connections.

C. Install storm drainage piping at the following minimum slopes unless otherwise indicated:
   
   1. Building Storm Drain: **1 percent** downward in direction of flow for piping NPS 4 (DN 100) and larger.

D. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."

E. Install aboveground copper tubing according to CDA's "Copper Tube Handbook."

F. Plumbing Specialties:
   1. Install drains in storm drainage gravity-flow piping. Comply with requirements for drains specified in Section 221423 "Storm Drainage Piping Specialties."

G. Install escutcheons for piping penetrations of walls, ceilings, and floors to fully cover rough opening- stainless steel with polished finish.

3.2 JOINT CONSTRUCTION


3.3 HANGER AND SUPPORT INSTALLATION

A. Provide the following:
   1. Install stainless-steel pipe support clamps for horizontal and vertical piping.
   2. Vertical Piping: MSS Type 8 or Type 42, clamps.
B. Support horizontal piping and tubing within 12 inches (300 mm) of each fitting, valve, and coupling.

C. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): 60 inches (1500 mm) with 3/8-inch (10-mm) rod.
2. NPS 3 (DN 80): 60 inches (1500 mm) with 1/2-inch (13-mm) rod.
3. NPS 4 and NPS 5 (DN 100 and DN 125): 60 inches (1500 mm) with 5/8-inch (16-mm) rod.
4. NPS 6 and NPS 8 (DN 150 and DN 200): 60 inches (1500 mm) with 3/4-inch (19-mm) rod.
5. NPS 10 and NPS 12 (DN 250 and DN 300): 60 inches (1500 mm) with 7/8-inch (22-mm) rod.
6. Spacing for 10-foot (3-m) pipe lengths may be increased to 10 feet (3 m). Spacing for fittings is limited to 60 inches (1500 mm).

D. Install supports for vertical cast-iron soil piping every 15 feet (4.5 m).

E. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 1-1/4 (DN 32): 72 inches (1800 mm) with 3/8-inch (10-mm) rod.
2. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): 96 inches (2400 mm) with 3/8-inch (10-mm) rod.
3. NPS 2-1/2 (DN 65): 108 inches (2700 mm) with 1/2-inch (13-mm) rod.
4. NPS 3 to NPS 5 (DN 80 to DN 125): 10 feet (3 m) with 1/2-inch (13-mm) rod.
5. NPS 6 (DN 150): 10 feet (3 m) with 5/8-inch (16-mm) rod.
6. NPS 8 (DN 200): 10 feet (3 m) with 3/4-inch (19-mm) rod.

F. Install supports for vertical copper tubing every 10 feet (3 m).

3.4 FIELD QUALITY CONTROL

A. Test storm drainage piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:

1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
2. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.

3.5 CLEANING

A. Clean interior of piping. Remove dirt and debris as work progresses.
B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

C. Place plugs in ends of uncompleted piping at end of day and when work stops.

3.6 PIPING SCHEDULE

A. Flanges and unions may be used on aboveground pressure piping unless otherwise indicated.

B. Aboveground storm drainage piping NPS 6 (DN 150) shall be the following:
   1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.

END OF SECTION 221413
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Roof drains.
   2. Miscellaneous storm drainage piping specialties.
   3. Flashing materials.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.4 QUALITY ASSURANCE

A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.

PART 2 - PRODUCTS

2.1 METAL ROOF DRAINS

A. Cast-Iron, Medium-Sump, General-Purpose Roof Drains

   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following

      b. Marathon Roofing Products.
      c. MIFAB, Inc.
      d. Portals Plus; Commercial Products Group of Hart & Cooley, Inc.
      f. Tyler Pipe.
      g. Watts Water Technologies, Inc.
      h. Zurn Plumbing Products Group; Light Commercial Products Operation.
2. Standard: ASME A112.6.4, for general-purpose roof drains.
4. Dimension of Body: 8-inch to 12 inch max. diameter
5. Combination Flashing Ring and Gravel Stop:
6. Outlet: Bottom

2.2 MISCELLANEOUS STORM DRAINAGE PIPING SPECIALTIES

A. Conductor Nozzles
   1. Description: Bronze body with threaded inlet and bronze wall flange with mounting holes.
   2. Size: Same as connected conductor.

2.3 FLASHING MATERIALS

A. Zinc-Coated Steel Sheet: ASTM A 653/A 653M, with 0.20 percent copper content and 0.04-inch (1.01-mm) minimum thickness unless otherwise indicated. Include G90 (Z275) hot-dip galvanized, mill-phosphatized finish for painting if indicated.

B. Elastic Membrane Sheet: ASTM D 4068, flexible, chlorinated polyethylene, 40-mil (1.01-mm) minimum thickness.

C. Fasteners: Metal compatible with material and substrate being fastened.

D. Metal Accessories: Sheet metal strips, clamps, anchoring devices, and similar accessory units required for installation; matching or compatible with material being installed.

E. Solder: ASTM B 32, lead-free alloy.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install roof drains at low points of roof areas according to roof membrane manufacturer's written installation instructions.
   1. Install flashing collar or flange of roof drain to prevent leakage between drain and adjoining roofing. Maintain integrity of waterproof membranes where penetrated.
   2. Install expansion joints, if indicated, in roof drain outlets.
   3. Position roof drains for easy access and maintenance.

B. Install conductor nozzles at exposed bottom of conductors where they spill onto grade.
3.2 CONNECTIONS

A. Comply with requirements for piping specified in Section 221413 "Facility Storm Drainage Piping." Drawings indicate general arrangement of piping, fittings, and specialties.

3.3 FLASHING INSTALLATION

A. Fabricate flashing from single piece of metal unless large pans, sumps, or other drainage shapes are required. Join flashing according to the following if required:

1. Lead Sheets: Burn joints of 6.0-lb/sq. ft. (30-kg/sq. m) lead sheets, 0.0938-inch (2.4-mm) thickness or thicker. Solder joints of 4.0-lb/sq. ft. (20-kg/sq. m) lead sheets, 0.0625-inch (1.6-mm) thickness or thinner.
2. Copper Sheets: Solder joints of copper sheets.

B. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.

1. Pipe Flashing: Sleeve type, matching the pipe size, with a minimum length of 10 inches (250 mm) and with skirt or flange extending at least 8 inches (200 mm) around pipe.
2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches (200 mm) around sleeve.
3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches (200 mm) around specialty.

C. Set flashing on floors and roofs in solid coating of bituminous cement.

D. Secure flashing into sleeve and specialty clamping ring or device.

E. Fabricate and install flashing and pans, sumps, and other drainage shapes.

3.4 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.

END OF SECTION 221423
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. This project may require extended work hours in order to meet the completion date. See Specification Section 00210 for Phasing and Schedule Requirements.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and haul-off of topsoil.
5. Removing above- and below-grade site improvements.
6. Temporary erosion- and sedimentation-control measures.

B. Related Sections:

1. Section 024119 "Selective Demolition" for partial demolition of buildings or structures.

1.3 DEFINITIONS

A. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

B. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow.

D. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects.
more than 2 inches in diameter; and free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.

E. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.

F. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and defined by a circle concentric with each tree with a radius 1.5 times the diameter of the drip line unless otherwise indicated.

G. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 MATERIAL OWNERSHIP

A. Cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 SUBMITTALS

A. Existing Conditions: documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.

1. Use sufficiently detailed photographs or videotape.
2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
3. Do not proceed with work on adjoining property until directed by Architect.

B. Utility Locator Service: Notify School District and Iowa One Call for area where Project is located before site clearing.
C. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant-protection measures are in place.

D. The following practices are prohibited within protection zones:
   1. Storage of construction materials, debris, or excavated material.
   2. Parking vehicles or equipment.
   3. Foot traffic.
   4. Erection of sheds or structures.
   5. Impoundment of water.
   6. Excavation or other digging unless otherwise indicated.
   7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

E. Do not direct vehicle or equipment exhaust towards protection zones.

F. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

G. Soil Stripping, Handling, and Stockpiling: Perform only when the topsoil is dry or slightly moist.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 312000 "Earth Moving."
   1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Locate and clearly identify trees, shrubs, and other vegetation to remain Wrap a 1-inch blue vinyl tie tape flag around each tree trunk at 54 inches above the ground.

C. Protect existing site improvements to remain from damage during construction.
   1. Restore damaged improvements to their original condition, as acceptable to Owner.
3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.

B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 TREE AND PLANT PROTECTION

A. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Architect.

3.4 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
2. Grind down stumps and remove roots, obstructions, and debris to a depth of 18 inches below exposed subgrade.
3. Use only hand methods for grubbing within protection zones.
4. Chip removed tree branches and dispose of off-site

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

3.5 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.

B. Remove slabs, paving, curbs, and gutters.
1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.

2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer’s written instructions. Keep paint off surfaces that will remain exposed.

3.6 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

B. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION 311000
PART 1 - GENERAL

1. RELATED DOCUMENTS
   A. This project may require extended work hours in order to meet the completion date. See Specification Section 00210 for Phasing and Schedule Requirements.
   B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. Section Includes:
      1. Preparing subgrades for slabs-on-grade, walks, pavements, turf and grasses and plants.
      2. Drainage course for concrete slabs-on-grade.
      4. Subbase course and base course for asphalt paving.
      5. Subsurface drainage backfill for walls and trenches.
   B. Related Sections:
      1. Section 311000 "Site Clearing" for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
      2. Section 329200 "Turf and Grasses" for finish grading in turf and grass areas, including preparing and placing planting soil for turf areas.
      3. Section 329300 "Plants" for finish grading in planting areas and tree and shrub pit excavation and planting.

1.3 DEFINITIONS
   A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
      1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
      2. Final Backfill: Backfill placed over initial backfill to fill a trench.
   B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.
C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
   1. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect or Owner. Unauthorized excavation, as well as remedial work directed by Architect or Owner, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu. yd. for bulk excavation or 3/4 cu. yd. for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:

I. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

J. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

K. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

L. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.4 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.

1.5 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.
1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Utility Locator Service: Notify School District and Iowa One Call for area where Project is located before beginning earth moving operations.

C. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures, specified in Section 311000 "Site Clearing," are in place.

D. Do not commence earth moving operations until plant-protection measures specified in "Temporary Tree and Plant Protection" section are in place.

E. The following practices are prohibited within protection zones:
   1. Storage of construction materials, debris, or excavated material.
   2. Parking vehicles or equipment.
   3. Foot traffic.
   4. Erection of sheds or structures.
   5. Impoundment of water.
   6. Excavation or other digging unless otherwise indicated.
   7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

F. Do not direct vehicle or equipment exhaust towards protection zones.

G. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Soil Classification Groups A-1, A-2-4, A-2-5, and A-3 according to AASHTO M 145, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
   1. Liquid Limit: 45.
   2. Plasticity Index: 25.

C. Unsatisfactory Soils: Soil Classification Groups A-2-6, A-2-7, A-4, A-5, A-6, and A-7 according to AASHTO M 145 or a combination of these groups.
1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.

F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.

H. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.

I. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch sieve and 0 to 5 percent passing a No. 4 sieve.

J. Sand: ASTM C 33; fine aggregate.

K. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.2 ACCESSORIES

A. Tracer Wire: See Section 276740

B. Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility; colored as follows:

2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

C. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with
metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:

2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.

B. Protect and maintain erosion and sedimentation controls during earth moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXPLOSIVES

A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

2. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:
   a. 24 inches outside of concrete forms other than at footings.
   b. 12 inches outside of concrete forms at footings.
   c. 6 inches outside of minimum required dimensions of concrete cast against grade.
   d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
   e. 6 inches beneath bottom of concrete slabs-on-grade.
   f. 6 inches beneath pipe in trenches, and the greater of 24 inches than pipe or 42 inches wide.

B. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Architect. Changes in the Contract Time may be authorized for rock excavation.

1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.
   a. Intermittent drilling; blasting, if permitted; ram hammering; or ripping of material not classified as rock excavation is earth excavation.

2. Rock excavation includes removal and disposal of rock. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction without exceeding the following dimensions:
   a. 24 inches outside of concrete forms other than at footings.
   b. 12 inches outside of concrete forms at footings.
   c. 6 inches outside of minimum required dimensions of concrete cast against grade.
   d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
   e. 6 inches beneath bottom of concrete slabs-on-grade.
   f. 6 inches beneath pipe in trenches, and the greater of 24 inches than pipe or 42 inches wide.

3.5 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

B. Excavations at Edges of Tree- and Plant-Protection Zones:

1. Excavate by hand to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.7 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2000 psi may be used when approved by Architect and owner.

3.8 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring and bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.9 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
B. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use satisfactory soil material.
3. Under steps and ramps, use engineered fill.
4. Under footings and foundations, use engineered fill.

C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.10 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.11 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 6 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 95 percent.
3. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 85 percent.
4. For utility trenches, compact each layer of initial and final backfill soil material at 95 percent.

3.12 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
   1. Turf or Unpaved Areas: Plus or minus 1 inch.
   2. Walks: Plus or minus 1/2 inch.
   3. Pavements: Plus or minus 1/2 inch.

3.13 SUBSURFACE DRAINAGE

A. Subdrainage Pipe: Specified in Section 334600 "Subdrainage."

B. Subsurface Drain: Place subsurface drainage geotextile around perimeter of subdrainage trench. Place a 4-inch course of filter material on subsurface drainage geotextile to support subdrainage pipe. Encase subdrainage pipe in a minimum of 24 inches of filter material, placed in compacted layers 6 inches thick, and wrap in subsurface drainage geotextile, overlapping sides and ends at least 12 inches.
   1. Compact each filter material layer to 85 percent of maximum dry unit weight according to ASTM D 698 with a minimum of two passes of a plate-type vibratory compactor.

C. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches of final subgrade, in compacted layers 6 inches thick. Overlay drainage backfill with one layer of subsurface drainage geotextile, overlapping sides and ends at least 12 inches.
   1. Compact each filter material layer to 85 percent of maximum dry unit weight according to ASTM D 698 [with a minimum of two passes of a plate-type vibratory compactor.
   2. Place and compact impervious fill over drainage backfill in 6-inch-thick compacted layers to final subgrade.

3.14 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

A. Place subbase course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase course under pavements and walks as follows:
   1. Install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
   2. Place base course material over subbase course under hot-mix asphalt pavement.
   3. Shape subbase course to required crown elevations and cross-slope grades.
   4. Place subbase course 6 inches or less in compacted thickness in a single layer.
5. Place subbase course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.

6. Compact subbase course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

C. Pavement Shoulders: Place shoulders along edges of subbase course to prevent lateral movement. Construct shoulders, at least 12 inches wide, of satisfactory soil materials and compact simultaneously with each subbase layer to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.15 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

A. Place drainage course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:

1. Install subdrainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
2. Place drainage course 6 inches or less in compacted thickness in a single layer.
3. Place drainage course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
4. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.16 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:

1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
2. Determine that fill material and maximum lift thickness comply with requirements.
3. Determine, at the required frequency, that in-place density of compacted fill complies with requirements.
4. See Soils Report for any special situations or instructions.

B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.

E. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:

1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft or less of paved area or building slab, but in no case fewer than three tests.
2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 100 feet or less of wall length, but no fewer than two tests.
3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet or less of trench length, but no fewer than two tests.

F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.17 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.18 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

B. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.
1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.
SECTION 321313 - CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. This project may require extended work hours in order to meet the completion date. See Specification Section 00210 for Phasing and Schedule Requirements.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Curbs and gutters.
   2. Walks.

B. Related Sections:
   1. Section 033000 "Cast-in-Place Concrete" for general building applications of concrete.
   2. Section 321373 "Concrete Paving Joint Sealants" for joint sealants in expansion and contraction joints within concrete paving and in joints between concrete paving and asphalt paving or adjacent construction.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Indicate pavement markings, lane separations, and defined parking spaces. Indicate, with international symbol of accessibility, spaces allocated for people with disabilities.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified ready-mix concrete manufacturer and testing agency.
B. Material Certificates: For the following, from manufacturer:

1. Cementitious materials.
2. Steel reinforcement and reinforcement accessories.
3. Fiber reinforcement.
4. Admixtures.
5. Curing compounds.
7. Bonding agent or epoxy adhesive.
8. Joint fillers.

C. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Detectable Warning Installer Qualifications: An employer of workers trained and approved by manufacturer of stamped concrete paving systems.

B. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" (Quality Control Manual - Section 3, "Plant Certification Checklist").

C. Testing Agency Qualifications: Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

D. Concrete Testing Service: Engage a qualified testing agency to perform material evaluation tests and to design concrete mixtures.

E. ACI Publications: Comply with ACI 301 unless otherwise indicated.

1.7 PROJECT CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for oil-based materials, 55 deg F for water-based materials, and not exceeding 95 deg F.
PART 2 - PRODUCTS

2.1 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.
   
   1. Use flexible or uniformly curved forms for curves with a radius of 100 feet or less.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.2 STEEL REINFORCEMENT

A. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, fabricated from as-drawn steel wire into flat sheets.


C. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.

D. Plain-Steel Wire: ASTM A 82/A 82M,[as drawn

E. Deformed-Steel Wire: ASTM A 496/A 496M.

F. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 plain-steel bars; zinc coated Cut bars true to length with ends square and free of burrs.

G. Tie Bars: ASTM A 615/A 615M, Grade 60 deformed.

H. Hook Bolts: ASTM A 307, Grade A internally and externally threaded. Design hook-bolt joint assembly to hold coupling against paving form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.

I. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:
   
   1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
   2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

J. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating, compatible with epoxy coating on reinforcement.
K. Zinc Repair Material: ASTM A 780.

2.3 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of same type, brand, and source throughout Project:

1. Portland Cement: ASTM C 150, white portland cement Type I or Type II. Supplement with the following:
   a. Fly Ash: ASTM C 618, Class C or Class F.
   b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

B. Normal-Weight Aggregates: ASTM C 33, uniformly graded. Provide aggregates from a single source with documented service-record data of at least 10 years’ satisfactory service in similar paving applications and service conditions using similar aggregates and cementitious materials.

   1. Maximum Coarse-Aggregate Size: 1-1/2 inches or 1 inch nominal.
   2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: Potable and complying with ASTM C 94/C 94M.


E. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

   1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
   2. Retarding Admixture: ASTM C 494/C 494M, Type B.
   3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
   4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
   5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
   6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.4 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.
D. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.

1. **Products**: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. BASF Construction Chemicals, LLC; Confilm.
   b. ChemMasters; Spray-Film.
   c. Conspec by Dayton Superior; Aquafilm.
   d. Dayton Superior Corporation; Sure Film (J-74).
   e. Edoco by Dayton Superior; BurkeFilm.
   f. Euclid Chemical Company (The), an RPM company; Eucobar.
   g. Meadows, W. R., Inc.; EVAPRE.
   h. Metalcrete Industries; Waterhold.
   i. Sika Corporation, Inc.; SikaFilm.
   j. SpecChem, LLC; Spec Film.
   k. Unitex; PRO-FILM.
   l. Vexcon Chemicals Inc.; Certi-Vex EnvioAssist.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

1. **Products**: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. ChemMasters; Safe-Cure Clear.
   b. Dayton Superior; Resin Cure with dye J11WD.
   c. Euclid Chemical Company (The), an RPM company; Euco Rez-Seal.
   d. Meadows, W. R., Inc.; 1100-CLEAR SERIES.
   e. SpecChem, LLC; Spec Rez.
   g. Right Pointe Co.; Clear Water Resin.

2.5 RELATED MATERIALS

A. Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork in preformed strips.

B. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.

C. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

D. Chemical Surface Retarder: Water-soluble, liquid, set retarder with color dye, for horizontal concrete surface application, capable of temporarily delaying final hardening of concrete to a depth of 1/8 to 1/4 inch.
1. Products: Subject to compliance with requirements, [provide the following] [provide one of the following] [available products that may be incorporated into the Work include, but are not limited to, the following]:

   a. ChemMasters; Exposee.
   b. Conspec by Dayton Superior; Delay S.
   c. Dayton Superior Corporation; Sure Etch (J-73).
   d. Edoco by Dayton Superior; True Etch Surface Retarder.
   e. Euclid Chemical Company (The), an RPM company; Surface Retarder Formula S.
   f. Meadows, W. R., Inc.; TOP-STOP.
   g. Scofield, L. M. Company; LITHOTEX Top Surface Retarder.
   h. Sika Corporation, Inc.; Rugasol-S.
   i. SpecChem, LLC; Spec Etch.
   j. Vexcon Chemicals Inc.; Certi-Vex Envioset.

2.6 CONCRETE MIXTURES

   A. Prepare design mixtures, proportioned according to IDOT Class C or Class M mix.

   B. Proportion mixtures to provide normal-weight concrete with the following properties:

      2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45.

   C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:

      1. Air Content: Target 7 percent plus or minus 1.5 percent, measured on grade prior to consolidation.

   D. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

   E. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

      1. Use water-reducing admixture in concrete as required for placement and workability.
      2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

   F. Cementitious Materials: Use fly ash, and ground granulated blast-furnace slag as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.[Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:]

      1. Fly Ash: 20 percent.
2. Ground Granulated Blast-Furnace Slag: 35 percent.
3. Combined Fly Ash and Ground Granulated Blast-Furnace Slag: 40 percent.

2.7 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subbase surface below concrete paving to identify soft pockets and areas of excess yielding.

1. Completely proof-roll subbase. Limit vehicle speed to 3 mph.
2. Proof-roll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
3. Correct subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch according to requirements in Section 312000 "Earth Moving."

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.
3.4 STEEL REINFORCEMENT

A. General: Comply with CRSI’s "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

D. Install welded wire reinforcement 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.

E. Zinc-Coated Reinforcement: Use galvanized-steel wire ties to fasten zinc-coated reinforcement. Repair cut and damaged zinc coatings with zinc repair material.

F. Epoxy-Coated Reinforcement: Use epoxy-coated steel wire ties to fasten epoxy-coated reinforcement. Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M.

G. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch overlap of adjacent mats.

3.5 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.

2. Provide tie bars at sides of paving strips where indicated.

3. Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.

4. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.
C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.

1. Locate expansion joints at existing walks, buildings and as otherwise indicated in the plans.
2. Extend joint fillers full width and depth of joint.
3. Terminate joint filler not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
6. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows, to match jointing of existing adjacent concrete paving:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4-inch radius. Repeat grooving of contraction joints after applying surface finishes.
   a. Tolerance: Ensure that grooved joints are within 2 inches either way from centers of dowels.

2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.
   a. Tolerance: Ensure that sawed joints are within 2 inches either way from centers of dowels.

3. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes.

3.6 CONCRETE PLACEMENT

A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast-in.
B. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery. Do not add water to fresh concrete after testing.

F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

G. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.
   1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement dowels and joint devices.

H. Screed paving surface with a straightedge and strike off.

I. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

J. Curbs and Gutters: Use design mixture for automatic machine placement. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing.

K. Slip-Form Paving: Use design mixture for automatic machine placement. Produce paving to required thickness, lines, grades, finish, and jointing.
   1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of slip-form paving machine during operations.

L. Cold-Weather Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:
   a. Paving: Do not place aggregates containing frozen lumps, and do not place concrete on a frozen subgrade or subbase. Take all necessary actions to prevent the pavement from freezing.

      1) Concrete mixing and placement may be started, if weather conditions are favorable, when the air temperature is at least 34ºF and rising. At the time of placement, concrete must have a temperature of at least 40ºF.
2) Stop mixing and placing when the air temperature is 38°F or less and falling or if the temperature stops rising and does not reach 38°F.

b. Protection: Prior to applying protection, cure all concrete pavement and curb/gutters, including exposed edges of the pavement and curb. In addition, protect concrete less than 36 hours old as follows:

<table>
<thead>
<tr>
<th>Night Temperature Forecast</th>
<th>Type of Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>35°F to 32°F</td>
<td>One layer of burlap for concrete.</td>
</tr>
<tr>
<td>31°F to 25°F</td>
<td>Two layers of burlap or one layer of plastic on one layer of burlap.</td>
</tr>
<tr>
<td>Below 25°F</td>
<td>Four layers of burlap between layers of 4 mil plastic or equivalent commercial insulating material approved by the Engineer.</td>
</tr>
</tbody>
</table>

c. Keep protection in place until one of the following conditions is met:
   a. The pavement is 5 calendar days old.
   b. Opening strength is attained.
   c. Forecasted low temperatures exceed 35°F for the next 48 hours.
   d. Forecasted high temperatures exceed 55°F for the next 24 hours and subgrade temperatures are above 40°F.

1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.
4. Shut down paving operations in time to comply with protection requirements outlined above. During cold weather, allow more time for finishing and protection. Perform all finishing and covering operations prior to darkness. Temperature restrictions and protection requirements may be modified by the Engineer.
5. Equivalent commercial insulating material approved by the Engineer may be used. This material must be waterproof and have a minimum R value of 1.0. If initial set has not yet occurred, place a layer of burlap on top of concrete prior to placing insulating blankets.
6. Use a method of protection and materials that will maintain the concrete temperature above 40°F.

M. Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:
1. Hot weather condition is defined as any combination of the following conditions that tend to impair the quality of plastic concrete by accelerating the rate of moisture loss and rate of cement hydration causing thermal shrinkage and resulting in plastic shrinkage cracking:
   - High Ambient Temperature
   - High Concrete Temperature
   - Low Relative Humidity
   - High Wind Velocity
   - Solar Radiation

2. a. General:
   1) During hot weather conditions, the Engineer may restrict concrete placement to early morning or evening hours.
   2) During hot weather conditions, advise the Engineer of the results of the theoretical evaporation rate throughout paving operations.

b. Determine the Theoretical Rate of Evaporation: Use the following chart and the National Weather Service's predicted maximum air temperature, relative humidity, and maximum steady wind velocity without gusts, for the date and the location of the paving pour.
c. If the evaporation rate exceeds 0.1 pounds per square foot per hour but is less than 0.3 pounds per square foot per hour, provide the following concrete evaporation protection.

1) Immediately apply an approved evaporation retarder to the concrete pavement and curbs or increase the surface cure application to 1.5 times the standard specified rate.
2) Take special precautions to ensure that the forms and subgrade are sufficiently moist or protected to avoid lowering the water content at the pavement/subgrade interface. In hot weather conditions, moisten the subgrade the evening before operations.
3) Ensure that the time between placing and curing is minimized and eliminate delays.
4) Moisten concrete aggregates that are dry and absorptive.
5) Use a fog spray to raise the relative humidity of the ambient air if there is a delay in immediately applying the curing compound.
6) Minimize solar heat by shading, wetting, or covering concrete chutes or other equipment that comes in contact with plastic concrete.

To Use this Chart:

1. Enter with air temperature, move up to relative humidity.
2. Move right to concrete temperature.
3. Move down to wind velocity.
4. Move left, read approximate rate of evaporation.

d. If the evaporation rate is 0.3 pounds per square foot per hour or greater,
discontinue placement of concrete.

### 3.7 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Burlap Finish: Drag a seamless strip of damp burlap across float-finished concrete, perpendicular to line of traffic, to provide a uniform, gritty texture.
2. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.
3. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.

### 3.8 SPECIAL FINISHES (Not Used)

### 3.9 DETECTABLE WARNINGS (Not Used)

### 3.10 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

A. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound or a combination of these as follows:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
a. Water.
b. Continuous water-fog spray.
c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover, placed in widest practicable width, with sides and ends lapped at least 12 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears occurring during installation or curing period using cover material and waterproof tape.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas that have been subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating, and repair damage during curing period.

3.11 PAVING TOLERANCES

A. Comply with tolerances in ACI 117 and as follows:

1. Elevation: 3/4 inch.
3. Surface: Gap below 10-foot-long, unleveled straightedge not to exceed 1/2 inch.
4. Alignment of Tie-Bar End Relative to Line Perpendicular to Paving Edge: 1/2 inch per 12 inches of tie bar.
5. Lateral Alignment and Spacing of Dowels: 1 inch.
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge: 1/4 inch per 12 inches of dowel.
8. Joint Spacing: 3 inches.

3.12 PAVEMENT MARKING (Not Used)

3.13 WHEEL STOPS (Not Used)

3.14 PREFORMED TRAFFIC-CALMING DEVICES (Not Used)

3.15 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 5000 sq. ft. or fraction thereof of each concrete mixture placed each day.
   a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when it is 80 deg F and above, and one test for each composite sample.

5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.

6. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days and two specimens at 28 days.
   a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.

C. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

D. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.

G. Concrete paving will be considered defective if it does not pass tests and inspections.
H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

I. Prepare test and inspection reports.

3.16 REPAIRS AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.

B. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.

C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 321313
SECTION 321373 - CONCRETE PAVING JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. This project may require extended work hours in order to meet the completion date. See Specification Section 00210 for Phasing and Schedule Requirements.
   B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. Section Includes:
      1. Cold-applied joint sealants.
      2. Hot-applied joint sealants.
   B. Related Sections:
      1. Section 079200 "Joint Sealants" for sealing nontraffic and traffic joints in locations not specified in this Section.
      2. Section 321313 "Concrete Paving" for constructing joints in concrete pavement.

1.3 PRECONSTRUCTION TESTING (Not Used)

1.4 ACTION SUBMITTALS
   A. Product Data: For each joint-sealant product indicated.
   B. Pavement-Joint-Sealant Schedule: Include the following information:
      1. Joint-sealant application, joint location, and designation.
      2. Joint-sealant color.

1.5 INFORMATIONAL SUBMITTALS
   A. Product Certificates: For each type of joint sealant and accessory, from manufacturer.
   B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for joint sealants.
1.6 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of joint sealant from single source from single manufacturer.

B. Product Testing: Test joint sealants using a qualified testing agency.
   1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

1.7 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:
   1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
   2. When joint substrates are wet.
   3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
   4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer based on testing and field experience.

A. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 COLD-APPLIED JOINT SEALANTS

A. Single-Component, Nonsag, Silicone Joint Sealant for Concrete: ASTM D 5893, Type NS.
   1. Products: Subject to compliance with requirements, provide one of the following available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Crafco Inc., an ERGON company; RoadSaver Silicone.
      b. Dow Corning Corporation; 888.
      c. Pecora Corporation; 301 NS.
B. Single-Component, Self-Leveling, Silicone Joint Sealant for Concrete: ASTM D 5893, Type SL.
   1. **Products:** Subject to compliance with requirements, provide one of the following available products that may be incorporated into the Work include, but are not limited to, the following:
      a. **Crafco Inc.,** an ERGON company; **RoadSaver Silicone SL.**
      b. **Dow Corning Corporation; 890-SL.**
      c. **Pecora Corporation; 300 SL.**

C. Multicomponent, Pourable, Traffic-Grade, Urethane Joint Sealant for Concrete: ASTM C 920, Type M, Grade P, Class 25, for Use T.
   1. **Products:** Subject to compliance with requirements, provide one of the following available products that may be incorporated into the Work include, but are not limited to, the following:
      a. **Pecora Corporation; Urexpans NR-200.**

2.3 HOT-APPLIED JOINT SEALANTS

   1. **Products:** Subject to compliance with requirements, provide one of the following available products that may be incorporated into the Work include, but are not limited to, the following:
      a. **Crafco Inc.,** an ERGON company; **Superseal 444/777.**

   1. **Products:** Subject to compliance with requirements, provide one of the following available products that may be incorporated into the Work include, but are not limited to, the following:
      a. **Meadows, W. R., Inc.; [Sealtight Hi-Spec] [Sealtight 3405].**
      b. **Right Pointe; D-3405 Hot Applied Sealant.**

2.4 JOINT-SEALANT BACKER MATERIALS

A. General: Provide joint-sealant backer materials that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint-sealant manufacturer based on field experience and laboratory testing.
B. Round Backer Rods for Cold- and Hot-Applied Joint Sealants: ASTM D 5249, Type 1, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.

C. Round Backer Rods for Cold-Applied Joint Sealants: ASTM D 5249, Type 3, of diameter and density required to control joint-sealant depth and prevent bottom-side adhesion of sealant.

D. Backer Strips for Cold- and Hot-Applied Joint Sealants: ASTM D 5249; Type 2; of thickness and width required to control joint-sealant depth, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.

2.5 PRIMERS

A. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.

B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.
B. Joint-Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install joint-sealant backings of kind indicated to support joint sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of joint-sealant backings.
2. Do not stretch, twist, puncture, or tear joint-sealant backings.
3. Remove absorbent joint-sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install joint sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place joint sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Joint Sealants: Immediately after joint-sealant application and before skinning or curing begins, tool sealants according to the following requirements to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint:

1. Remove excess joint sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.

F. Provide joint configuration to comply with joint-sealant manufacturer's written instructions unless otherwise indicated.

3.4 CLEANING

A. Clean off excess joint sealant or sealant smears adjacent to joints as the Work progresses, by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants, during and after curing period, from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and replace with joint sealant so installations in repaired areas are indistinguishable from the original work.
3.6    PAVEMENT-JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Joints within cement concrete pavement

1. Joint Location:
   c. Other joints as indicated.

3. Urethane Joint Sealant for Concrete: Multicomponent, pourable, traffic-grade.
5. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

B. Joint-Sealant Application: Joints between cement concrete and asphalt pavement.

1. Joint Location:
   a. Joints between concrete and asphalt pavement.
   b. Joints between concrete curbs and asphalt pavement.
   c. Other joints as indicated.

3. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

END OF SECTION 321373
SECTION 329200 - TURF AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. This project may require extended work hours in order to meet the completion date. See Specification Section 00210 for Phasing and Schedule Requirements.
   B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. Section Includes:
   B. Sodding. **SOD SHALL NOT CONTAIN MESH**
   C. Related Sections:

      1. Section 311000 "Site Clearing" for topsoil stripping and stockpiling.
      2. Section 329300 "Plants" for border edgings.

1.3 DEFINITIONS
   A. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.
   B. Finish Grade: Elevation of finished surface of planting soil.
   C. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
   D. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.
   E. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
F. Planting Soil: Standardized topsoil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

G. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or top surface of a fill or backfill before planting soil is placed.

H. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

I. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil, but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.
   1. Pesticides and Herbicides: Include product label and manufacturer's application instructions specific to this Project.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified landscape Installer.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful turf establishment.
   1. Experience: Three (3) years' experience in turf installation in addition to requirements in Section 014000 "Quality Requirements."
   2. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
   3. Maintenance Proximity: Not more than Two (2) hours' normal travel time from Installer's place of business to Project site.

B. Soil-Testing Laboratory Qualifications: An independent laboratory or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

C. Pre-installation Conference: Conduct conference at project site.
1.7 DELIVERY, STORAGE, AND HANDLING

A. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod in time for planting within 24 hours of harvesting. Protect sod from breakage and drying.

1.8 PROJECT CONDITIONS

A. Planting Restrictions: Coordinate planting periods with initial maintenance periods to provide required maintenance from date of Substantial Completion

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

1.9 MAINTENANCE SERVICE

A. Initial Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable turf is established but for not less than the following periods:

1. Sodded Turf: Sixty (60) days from date of planting completion.

PART 2 - PRODUCTS

2.1 SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.

B. Seed Species: Seed of grass species as follows, with not less than 95 percent germination, not less than 85 percent pure seed, and not more than 0.5 percent weed seed:

C. Grass Seed Mix: Proprietary seed mix as follows:

1. Products: Subject to compliance with requirements, provide the following
   a. Premium Sun and Shade Mix as sold by United Seeds, Inc., Des Moines, IA, (515) 282-1750, OR an approved equal supplier prior to bidding.
   b. Seeding Rate 6# per 1000 SF.
2.2 TURFGRASS SOD – SOD SHALL NOT CONTAIN MESH

A. Turfgrass Sod: Number 1 Quality/Premium, including limitations on thatch, weeds, diseases, nematodes, and insects, complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture, strongly rooted, and capable of vigorous growth and development when planted.

B. Turfgrass Species: Sod of grass species as follows, with not less than 95 percent germination, not less than 85 percent pure seed, and not more than 0.5 percent weed seed:

1. Full Sun: Kentucky bluegrass (Poa pratensis), a minimum of three cultivars.
2. Sun and Partial Shade: Proportioned by weight as follows:
   a. 50 percent Kentucky bluegrass (Poa pratensis).
   b. 30 percent chewings red fescue (Festuca rubra variety).
   c. 10 percent perennial ryegrass (Lolium perenne).
   d. 10 percent redtop (Agrostis alba).

3. Shade: Proportioned by weight as follows:
   a. 50 percent chewings red fescue (Festuca rubra variety).
   b. 35 percent rough bluegrass (Poa trivialis).
   c. 15 percent redtop (Agrostis alba).

2.3 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:

1. Class: T, with a minimum of 99 percent passing through No. 8 sieve and a minimum of 75 percent passing through No. 60 sieve.
2. Class: O, with a minimum of 95 percent passing through No. 8 sieve and a minimum of 55 percent passing through No. 60 sieve.
3. Provide lime in form of ground dolomitic limestone.

B. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, and with a minimum of 99 percent passing through No. 6 sieve and a maximum of 10 percent passing through No. 40 sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

D. Aluminum Sulfate: Commercial grade, unadulterated.

E. Perlite: Horticultural perlite, soil amendment grade.
F. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through No. 50 sieve.

G. Sand: Clean, washed, natural or manufactured, and free of toxic materials.

H. Diatomaceous Earth: Calcined, 90 percent silica, with approximately 140 percent water absorption capacity by weight.

I. Zeolites: Mineral clinoptilolite with at least 60 percent water absorption by weight.

2.4 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1/2-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

1. Organic Matter Content:  50 to 60 percent of dry weight. Compost may be produced from several feedstocks or raw materials

2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

B. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.

1. In lieu of decomposed wood derivatives, mix partially decomposed wood derivatives with ammonium nitrate at a minimum rate of 0.15 lb/cu. ft. of loose sawdust or ground bark, or with ammonium sulfate at a minimum rate of 0.25 lb/cu. ft. of loose sawdust or ground bark.

C. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

2.5 FERTILIZERS

A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 4 percent nitrogen and 20 percent phosphoric acid.

B. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.

C. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic
sources of urea formaldehyde, phosphorous, and potassium in the following composition:

1. Composition: 1 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

D. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

2.6 PLANTING SOILS FOR TURF AREAS

A. Planting Soil for Turf areas: ASTM D 5268 topsoil, with pH range of 5.5 to 7, a minimum of 6 percent organic material content; free of subsoil, clay or impurities, plants, weeds and roots. Free of rocks, stones, concrete, or other material greater than 1”.

2.3 MULCHES

A. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic and free of plant-growth or germination inhibitors; with a maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.

2.4 PESTICIDES

A. General: Pesticide, registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.
2.5 EROSION-CONTROL MATERIALS

A. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches long.

B. Erosion-Control Fiber Mesh: Biodegradable burlap or spun-coir mesh, a minimum of 0.92 lb/sq. yd., with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches long.

2.6 EROSION-CONTROL MATERIALS

A. Erosion-Control Mats: Cellular, non-biodegradable slope-stabilization mats designed to isolate and contain small areas of soil over steeply sloped surface, of 3-inch nominal mat thickness. Include manufacturer's recommended anchorage system for slope conditions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to be planted for compliance with requirements and other conditions affecting performance.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.

2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.

3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.

4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
1. Protect adjacent and adjoining areas from hydoseeding and hydromulching overspray.
2. Protect grade stakes set by others until directed to remove them.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 TURF AREA PREPARATION

A. Limit turf subgrade preparation to areas to be planted.

B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 4 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

C. Unchanged Subgrades: If turf is to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:
   1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
   2. Loosen surface soil to a depth of at least 6 inches, apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 6 inches of soil. Till soil to a homogeneous mixture of fine texture.
   3. Remove stones larger than 1 inch in any dimension and sticks, roots, trash, and other extraneous matter.
   4. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.

D. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.

E. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

F. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 PREPARATION FOR EROSION-CONTROL MATERIALS

A. Prepare area as specified in "Turf Area Preparation" Article.

B. For erosion-control mats, install planting soil in two lifts, with second lift equal to thickness of erosion-control mats. Install erosion-control mat and fasten as recommended by material manufacturer.
C. Fill cells of erosion-control mat with planting soil and compact before planting.

D. For erosion-control blanket or mesh, install from top of slope, working downward, and as recommended by material manufacturer for site conditions. Fasten as recommended by material manufacturer.

E. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

3.5 SODDING

A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.

B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.

1. Lay sod across angle of slopes exceeding 1:3.
2. Anchor sod on slopes exceeding 1:6 with wood pegs or steel staples spaced as recommended by sod manufacturer but not less than 2 anchors per sod strip to prevent slippage.

C. Saturate sod with fine water spray within two hours of planting. During first week after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below sod.

3.6 TURF MAINTENANCE

A. Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.

1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches.
1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.

2. Water turf with fine spray at a minimum rate of 1 inch per week unless rainfall precipitation is adequate.

C. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:
   1. Mow Kentucky bluegrass to a height of 1-1/2 to 2 inches.

D. Turf Post-fertilization: Apply fertilizer after initial mowing and when grass is dry.
   1. Use fertilizer that will provide actual nitrogen of at least 1 lb/1000 sq. ft. to turf area.

3.7 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by Architect:
   1. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.

B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

3.8 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents in accordance with requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.

3.9 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

C. Remove nondegradable erosion-control measures after grass establishment period.

END OF SECTION 329200
SECTION 329300 - PLANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. This project may require extended work hours in order to meet the completion date. See Specification Section 00210 for Phasing and Schedule Requirements.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Plants.
2. Planting soils.
3. Tree stabilization.
4. Landscape edgings.

B. Related Sections:

1. Section 311000 "Site Clearing" for protection of existing trees and plantings, topsoil stripping and stockpiling, and site clearing.
2. Section 312000 "Earth Moving" for excavation, filling, and rough grading and for subsurface aggregate drainage and drainage backfill materials.
3. Section 329200 "Turf and Grasses" for turf (lawn) and meadow planting, hydroseeding, and erosion-control materials.

1.3 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required; wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.

C. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.

D. Finish Grade: Elevation of finished surface of planting soil.
E. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

F. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

G. Pests: Living organisms that occur where they are not desired, or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

H. Planting Area: Areas to be planted.

I. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

J. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.

K. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

L. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.

M. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

N. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

O. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of owners' contact persons.

B. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:
1. Manufacturer's certified analysis of standard products.
2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

C. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before start of required maintenance periods.

D. Warranty: Sample of special warranty.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful establishment of plants.

1. Pesticide Applicator: State licensed, commercial.

B. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.

1. Selection of plants purchased under allowances will be made by Architect, who will tag plants at their place of growth before they are prepared for transplanting.

C. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.

1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches above the root flare for trees up to 4-inch size, and 12 inches above the root flare for larger sizes.

2. Other Plants: Measure with stems, petioles, and foliage in their normal position.

D. Plant Material Observation: Architect may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Architect retains right to observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.
B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

C. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

D. Handle planting stock by root ball.

E. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

1. Heel-in bare-root stock. Soak roots that are in dry condition in water for two hours. Reject dried-out plants.
2. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
3. Do not remove container-grown stock from containers before time of planting.
4. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly-wet condition.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

B. Interruption of Existing Services or Utilities: Do not interrupt services or utilities to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary services or utilities according to requirements indicated:

C. Planting Restrictions: Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

D. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may
be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

E. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.

1. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

1.8 WARRANTY

A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner, or incidents that are beyond Contractor's control.
   b. Structural failures including plantings falling or blowing over.
   c. Faulty performance of tree stabilization and/or edgings
   d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Periods from Date of Substantial Completion
   a. Trees, Shrubs, Vines, and Ornamental Grasses: 12 months.

3. Include the following remedial actions as a minimum:
   a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
   b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
   c. A limit of one replacement of each plant will be required except for losses or replacements due to failure to comply with requirements.
   d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

1.9 MAINTENANCE SERVICE

A. Initial Maintenance Service for Trees and Shrubs: Provide maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than maintenance period below.

1. Maintenance Period: Three (3) months from date of Substantial Completion
PART 2 - PRODUCTS

2.1 PLANT MATERIAL

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant Schedule or Plant Legend shown on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

1. **DO NOT PROVIDE EVERGREEN PLANTS**
2. **DO NOT PROVIDE ANY SHRUBS OR BUSHES THAT WILL EXCEED 36” IN HEIGHT AT FULL MATURITY.**
3. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch in diameter; or with stem girdling roots will be rejected.
4. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.

B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Architect, with a proportionate increase in size of roots or balls.

C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

D. If formal arrangements or consecutive order of plants is shown on Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

2.2 MULCHES

A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:

1. Type: Shredded hardwood
2. Size Range: 3 inches (76 mm) maximum, 1/2 inch (13 mm) minimum.

2.3 TREE STABILIZATION MATERIALS

A. Stakes and Guys:
1. Upright and Guy Stakes: Rough-sawn, sound, new hardwood free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal by length indicated, pointed at one end.

2. Flexible Ties: Wide rubber or elastic bands or straps of length required to reach stakes or compression springs.


4. Flags: Standard surveyor's plastic flagging tape, white, 6 inches long.

B. Root-Ball Stabilization Materials:

1. Upright Stakes and Horizontal Hold-Down: Rough-sawn, sound, new hardwood or softwood, free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal by length indicated; stakes pointed at one end.


2.4 LANDSCAPE EDGINGS

A. Steel Edging: Standard commercial-steel edging, rolled edge, fabricated in sections of standard lengths, with loops stamped from or welded to face of sections to receive stakes.

1. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   b. Collier Metal Specialties, Inc.
   c. Russell, J. D. Company (The).

2. Edging Size: 1/4 inch wide by 5 inches deep.

3. Stakes: Tapered steel, a minimum of 12 inches long.


5. Finish: Standard paint

6. Paint Color: Black

2.5 MISCELLANEOUS PRODUCTS

A. Wood Pressure-Preservative Treatment: AWPA C2, with waterborne preservative for soil and freshwater use, acceptable to authorities having jurisdiction, and containing no arsenic; including ammoniacal copper arsenate, ammoniacal copper zinc arsenate, and chromated copper arsenate.

B. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive plants for compliance with requirements and conditions affecting installation and performance.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Architect's acceptance of layout before excavating or planting. Make minor adjustments as required.

D. Lay out plants at locations directed by Architect. Stake locations of individual trees and shrubs and outline areas for multiple plantings.

E. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.
1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.

F. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

3.3 EXCAVATION FOR TREES AND SHRUBS

A. Planting Pits and Trenches: Excavate circular planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are not acceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.

1. Excavate approximately three times as wide as ball diameter for balled and burlapped stock.
2. Excavate at least 12 inches wider than root spread and deep enough to accommodate vertical roots for bare-root stock.
3. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
4. If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
5. Maintain required angles of repose of adjacent materials as shown on the Drawings. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
6. Maintain supervision of excavations during working hours.
7. Keep excavations covered or otherwise protected unattended by Installer's personnel.

B. Subsoil and topsoil removed from excavations may be used as planting soil.

C. Drainage: Notify Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.

D. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.4 TREE, SHRUB, AND VINE PLANTING

A. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

B. Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.
C. Set balled and burlapped stock plumb and in center of planting pit or trench with root flare 1 inch (25 mm) above adjacent finish grades.

1. Use planting soil for backfill.
2. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
5. Continue backfilling process. Water again after placing and tamping final layer of soil.

D. When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.5 TREE, SHRUB, AND VINE PRUNING

A. Remove only dead, dying, or broken branches. Do not prune for shape.
B. Prune, thin, and shape trees, shrubs, and vines as directed by Architect.
C. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.
D. Do not apply pruning paint to wounds.

3.6 TREE STABILIZATION

A. Install trunk stabilization as follows unless otherwise indicated:

1. Upright Staking and Tying: Stake trees of 2- through 5-inch caliper. Stake trees of less than 2-inch caliper only as required to prevent wind tip out. Use a minimum of two stakes of length required to penetrate at least 18 inches below bottom of backfilled excavation and to extend to the dimension shown on Drawings above grade. Set vertical stakes and space to avoid penetrating root balls or root masses.
2. Use two stakes for trees up to 12 feet high and 2-1/2 inches or less in caliper; three stakes for trees less than 14 feet high and up to 4 inches in caliper. Space stakes equally around trees.
3. Support trees with bands of flexible ties at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.
4. Support trees with two strands of tie wire, connected to the brass grommets of tree-tie webbing at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.

B. Root-Ball Stabilization: Install at- or below-grade stabilization system to secure each new planting by the root ball unless otherwise indicated.

1. Wood Hold-Down Method: Place vertical stakes against side of root ball and drive them into subsoil; place horizontal wood hold-down stake across top of root ball and screw at each end to one of the vertical stakes.
   a. Install stakes of length required to penetrate at least 18 inches below bottom of backfilled excavation. Saw stakes off at horizontal stake.
   b. Install screws through horizontal hold-down and penetrating at least 1 inch into stakes. Predrill holes if necessary to prevent splitting wood.
   c. Install second set of stakes on other side of root trunk for larger trees as indicated.

3.7 PLANTING AREA MULCHING

A. Install weed-control barriers before mulching according to manufacturer’s written instructions. Completely cover area to be mulched, overlapping edges a minimum of 6 inches and secure seams with galvanized pins.

3.8 EDGING INSTALLATION

A. Steel Edging: Install steel edging where indicated according to manufacturer’s written instructions. Anchor with steel stakes spaced approximately 30 inches apart, driven below top elevation of edging.

3.9 PLANT MAINTENANCE

A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.

B. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.
C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated past management practices whenever possible to minimize the use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

3.10 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents in accordance with authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Pre-Emergent Herbicides (Selective and Non-Selective): Apply to tree, shrub, and ground-cover areas in accordance with manufacturer's written recommendations. Do not apply to seeded areas.

C. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.

3.11 CLEANUP AND PROTECTION

A. During planting, keep adjacent paving and construction clean and work area in an orderly condition.

B. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

C. After installation and before Substantial Completion remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

3.12 DISPOSAL

A. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

END OF SECTION 329300
SECTION 334600 - SUBDRAINAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Perforated-wall pipe and fittings.
   2. Geotextile filter fabrics.

1.3 ACTION SUBMITTALS

A. Product Data:
   1. Geotextile filter fabrics.

PART 2 - PRODUCTS

2.1 PERFORATED-WALL PIPES AND FITTINGS

A. Perforated PE Pipe and Fittings:
   1. NPS 6 (DN 150) and Smaller: ASTM F 405 or AASHTO M 252, Type CP; corrugated, for coupled joints.

2.2 SOIL MATERIALS

A. Soil materials are specified in Section 312000 "Earth Moving."

2.3 GEOTEXTILE FILTER FABRICS

A. Description: Fabric of PP or polyester fibers or combination of both, with flow rate range from 110 to 330 gpm/sq. ft. (4480 to 13 440 L/min. per sq. m) when tested according to ASTM D 4491.
B. Structure Type: Nonwoven, needle-punched continuous filament.

1. Survivability: AASHTO [M 288 Class 2]
2. Styles: Flat and sock.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces and areas for suitable conditions where subdrainage systems are to be installed.

B. If subdrainage is required for landscaping, locate and mark existing utilities, underground structures, and aboveground obstructions before beginning installation and avoid disruption and damage of services.

C. Verify that drainage panels installed as part of foundation wall waterproofing is properly positioned to drain into subdrainage system.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Section 312000 "Earth Moving."

3.3 RETAINING-WALL DRAINAGE INSTALLATION

A. Lay flat-style geotextile filter fabric in trench and overlap trench sides.

B. Place supporting layer of drainage course over compacted subgrade to compacted depth of not less than 4 inches (100 mm).

C. Encase pipe with sock-style geotextile filter fabric before installing pipe. Connect sock sections with adhesive or tape.

D. Install drainage piping as indicated in Part 3 "Piping Installation" Article for retaining-wall subdrainage.

E. Add drainage course to width of at least 6 inches (150 mm) on side away from wall and to top of pipe to perform tests.

F. After satisfactory testing, cover drainage piping to width of at least 6 inches (150 mm) on side away from footing and above top of pipe to within 12 inches (300 mm) of finish grade.
G. Place drainage course in layers not exceeding 3 inches (75 mm) in loose depth; compact each layer placed and wrap top of drainage course with flat-style geotextile filter fabric.

H. Place layer of flat-style geotextile filter fabric over top of drainage course, overlapping edges at least 4 inches (100 mm).

I. Fill to Grade: Place satisfactory soil fill material over compacted drainage course. Place material in loose-depth layers not exceeding 6 inches (150 mm). Thoroughly compact each layer. Fill to finish grade.

3.4 IDENTIFICATION

A. Arrange for installation of green warning tapes directly over piping. Comply with requirements for underground warning tapes specified in Section 312000 "Earth Moving."

1. Install PE warning tape or detectable warning tape over ferrous piping.
2. Install detectable warning tape over nonferrous piping and over edges of underground structures.

3.5 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. After installing drainage course to top of piping, test drain piping with water to ensure free flow before backfilling.
2. Remove obstructions, replace damaged components, and repeat test until results are satisfactory.

B. Drain piping will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.6 CLEANING

A. Clear interior of installed piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed. Place plugs in ends of uncompleted pipe at end of each day or when work stops.

END OF SECTION 334600
PROJECT SITE PLAN

LOCATION:

EXISTING PUBLIC SIDEWALK

EXISTING ZONING DISTRICT: PD

SITE PLAN APPROVAL:

APPROVED

APPROVED WITH CONDITIONS - SEE EXHIBIT "A"

IN ACCORDANCE WITH SECTION 13.6, 2010 DES MONIES MUNICIPAL CODE, AS AMENDED.

NO CHANGES TO THIS PLAN UNLESS APPROVED IN WRITING FROM THE COMMUNITY DEVELOPMENT DIRECTOR.

COMMUNITY DEVELOPMENT DIRECTOR: ______________________ DATE: __________

LEGAL DESCRIPTION:

ADDRESS:

2301 CENTER STREET

LAND USE: PUBLIC, CIVIC, INSTITUTIONAL

EXISTING ZONING DISTRICT: PD

SET BACKS: N/A

LAND AREA: N/A

DISTURBED SOIL: 0.23 acres (reclaiming wet soil)

BUILDING AREA: N/A

GENERAL NOTES:

1. WORK SCORPIO SIDEWALK WITH AN ASSOCIATED CONCRETE STAIR REPLACEMENT INSIDE THE PROPEITY BOUNDARY, TO BE CONSTRUCTED AT VARIOUS LOCATIONS AROUND THE BUILDING.

2. NO WORK PROPOSED IN THE R.O.W. (EAST RETAINING WALL IS ON R.O.W. LINE BACKSIDE OF PUBLIC SIDEWALK)

3. NO NEW PUBLIC SIDEWALKS ARE TO BE CONSTRUCTED AT VARIOUS LOCATIONS AROUND THE BUILDING.

4. AN EXISTING DUMPSTER ENCLOSURE IS PRESENT ON THE SOUTH EAST SIDE OF THE SCHOOL.

5. THIS SITE SHALL BE MAINTAINED IN COMPLIANCE WITH ALL CITY CODES APPLICABLE ON THE DATE OF SITE PLAN APPROVAL.

6. NO PROPOSED NEW ROOF TOP MECHANICAL EQUIPMENT.

7. NO TRANSFORMERS, JUNCTION BOXES, AIR CONDITIONERS ARE PROPOSED.

8. ANY AMENDMENTS OR CHANGES TO THE PROJECT SITE THAT DO NOT MEET WHAT IS SHOWN ON THIS SITE PLAN NEED TO BE APPROVED WITH THE PERMIT AND DEVELOPMENT CENTER PRIOR TO INSTALLATION/CONSTRUCTION.

9. PROVIDE SECURITY AND MONITORING SYSTEM FREQUENTING FILTER SUEDS AT SIDEWALKS AND DRIVES AS INDICATED TO PREVENT ALL PROJECT BUT FROM LEAVING THE SITE.

10. ALL DISTURBED AREAS SHOULD BE RESTORED BY SEEING OR SODDING.

APPLICANT:

NAME: DES MONIES INDEPENDENT COMM. SCHOOL DIST.

ADDRESS: 1801 16TH STREET

Des Moines, IA 50314

CONTACT (PREPARED BY):

NAME: DES MONIES INDEPENDENT COMM. SCHOOL DIST.

ADDRESS: 1801 16TH STREET

Des Moines, IA 50314

PHONE: 515-242-3231

EMAIL: info@dmmelee.com

DESIGNER:

NAME: DES MONIES INDEPENDENT COMM. SCHOOL DIST.

ADDRESS: 1801 16TH STREET

Des Moines, IA 50314

PHONE: 515-266-8575

EMAIL: info@dmmelee.com

LEGAL DESCRIPTION:

ADDRESS:

2301 CENTER STREET

LAND USE: PUBLIC, CIVIC, INSTITUTIONAL

EXISTING ZONING DISTRICT: PD

SET BACKS: N/A

LAND AREA: N/A

DISTURBED SOIL: 0.23 acres (reclaiming wet soil)

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GENERAL NOTES:

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9. PROVIDE SECURITY AND MONITORING SYSTEM FREQUENTING FILTER SUEDS AT SIDEWALKS AND DRIVES AS INDICATED TO PREVENT ALL PROJECT BUT FROM LEAVING THE SITE.

10. ALL DISTURBED AREAS SHOULD BE RESTORED BY SEEING OR SODDING.
EXISTING COPPER FLASHING TO REMOVAL.

EXISTING METAL SLIGHT.

EXISTING COPPER FACE.

EXISTING MALLION SECTION PLAN.

SCALE 1" = 1'-0"

EXISTING MALLION SECTION.

SCALE 1" = 1'-0"

EXISTING COPPER FLASHING TO REMOVAL.

EXISTING COPPER FACE.

EXISTING MALLION SECTION PLAN.

SCALE 1" = 1'-0"

EXISTING MALLION SECTION.

SCALE 1" = 1'-0"

RE-FABRICATE WOOD ALL DOWELS (SEE EXISTING STONE SILL DRAWINGS)

RE-FABRICATE WOOD ALL EXISTING STONE SILL DRAWINGS

SPECIFICATION AND ELEVATIONS)

PAINT TO MATCH MULLION

DIP IN WOOD PRESERVATIVE

REPLACED ON ELEVATIONS-

RE-FABRICATE WOOD ALL EXISTING WOOD MULLIONS

CLEAN AND REPAINT PER STEEL WINDOW HEADERS

STOREFRONT WINDOWS, EXISTING STONE SILL-

EXISTING ALUM.

RESTORE EXTERIOR WOOD MULLION- SEE ELEVATIONS

EXISTING ALUM. STOREFRONT WINDOWS, EXISTING STONE SILL-

RESTORE EXTERIOR WOOD MULLION- SEE ELEVATIONS

PROPERLY APPLY PAINT ON THE EXTERIOR COVERING WOOD MUNTIN, OR PROVIDE NEW WEATHER STRIPPING AROUND THE DOOR PERIMETER.

GLAZING TAPE GAP FILLED WITH GLAZING PUTTY AND PITCHED TO SHED GLAZING POINTS, IS TO BE REPLACED, IN KIND, WITH NEW PUTTY AND REFINISH THE INTERIOR AND EXTERIOR PER PAINTING SPECIFICATION.

RESET IN SALVAGED OR NEWLY FABRICATED WOOD MUNTINS AND STOPS.

TINTED GLASS SHALL NOT BE ALLOWED.

SEE SPECIFICATION SECTION 068000 "EXTERIOR WOOD REPAIR".

WEATHER PROOF SEAL.

SMOOTH WOOD FACE

EXISTING COPPER FLASHING TO REMOVAL.

EXISTING COPPER FACE.

EXISTING MALLION SECTION PLAN.

SCALE 1" = 1'-0"

EXISTING MALLION SECTION.

SCALE 1" = 1'-0"

EXISTING COPPER FLASHING TO REMOVAL.

EXISTING COPPER FACE.

EXISTING MALLION SECTION PLAN.

SCALE 1" = 1'-0"

EXISTING MALLION SECTION.

SCALE 1" = 1'-0"
EXISTING INTERIOR TRIM TO REMAIN - NO RE-PAINT TRANSOM FRAME

TYPICAL NEW SEALANT ALL JOINTS SEE

REMOVE AND REPLACE EXISTING WOOD TRANSOM HORIZONTAL - PAINT EXISTING ALUMINUM WINDOW

NEW QUARTER ROUND TRIM

RE-PAINT EXISTING PANEL

WORK

REFINISH FRAME TRIM

MULLION PLAN - ENTRANCE TRANSOM

SCALE: 3" = 1'-0"

ELEVATIONS

GLAZING TO REMAIN - PROTECT FROM RE-PAINT TRANSOM FRAME

WOOD DOOR PLAN - MAIN ENTRANCE

SCALE: 3" = 1'-0"

3. EXISTING HOLLOW EXST. WOOD TRIM

METAL DOOR AND IS OVERLAID ON LIGHT FIXTURE

REPAINT EXISTING CLEAN AND

EXISTING KICKPLATE MATERIAL AND NEW

PROVIDE NEW WEATHER STRIPPING AROUND THE DOOR PERIMETER.

RESET IN SALVAGED OR NEWLY FABRICATED WOOD MUNTINS AND STOPS.

TINTED GLASS SHALL NOT BE ALLOWED.

WATER. (THE EXISTING GLAZING TAPE GAP IS TRAPPING WATER AND WHERE MUNTINS CANNOT BE REPAIRED, MILL NEW PROFILE TO MATCH ALL RESTORED GLASS SHALL BE CLEAR GLASS. NON-REFLECTIVE OR TRANSPARENT MATERIAL, AND NEW FASTENERS, EPOXY REPAIRS AS SPECIFIED.

RESET GLAZING AND REPAIR WINDOW WHERE POSSIBLE FRAME MATERIAL REPAIRED IN THE OPENING, OR FRAME REPAIRED OR EPOXY, AS REQUIRED, AND REINSTALL BRICK PROPERLY APPLY PAINT ON THE EXTERIOR COVERING WOOD MUNTIN, OR REFINISH THE INTERIOR AND EXTERIOR PER PAINTING SPECIFICATION.

EXISTING HORIZONTAL MUNTIN TOPS SHALL HAVE THE EXTERIOR DOOR GLAZING IS TYPICAL SINGLE PANE GLASS SET IN WOOD STOPS WITH EPOXY REPAIRS AS SPECIFIED.

CAREFULLY REMOVE AND CLEAN ALL SCHEDULED GLASS, THEN FASTEN THROUGH SINGLE PANE GLASS, AS REQUIRED, AND FOUR MOUNTING BRACKETS SPANNING FOUR TRANSOM MUNTINS. EPOXY REPAIRS AS SPECIFIED.

FASTENERS ARE REQUIRED TO PROVIDE FULL TRACTION BETWEEN FASTENERS AND GLASS. THE FASTENERS ARE TO BE NON-FERROUS REPLACEMENT FASTENERS ONLY - EXISTING APPEARS TO BE COPPER - VERIFY NON-FERROUS REPLACEMENT FASTENERS ONLY - EXISTING APPEARS TO BE COPPER - VERIFY.

BRICK IN SCHEDULED MOUNTIN TOPS MEET SPECIFICATION. 600 SERIES BRICK USED.  6 INCH ADHESIVE BRICK MORTAR USED.

EXTERIOR COVERING WOOD MUNTIN, OR REFINISH THE INTERIOR AND EXTERIOR PER PAINTING SPECIFICATION.