PROJECT MANUAL
FOR
LINCOLN HIGH SCHOOL
SCIENCE & SPED CLASSROOMS UPDATES

Bid No: B8725

2600 SW 9th Street
Des Moines, Iowa 50315

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

Architect

Studio MELEE
139 Fourth Street
West Des Moines, Iowa 50265
ARCHITECT'S CERTIFICATION:
I hereby certify that the portion of this technical submission described below was 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.

Christopher P. Wernimont, AIA  07211  07 December 2021
License Expires:  June 30th, 2023
Pages or sheets covered by this seal:  Divisions 00-12

MECHANICAL, ELECTRICAL, AND PLUMBING ENGINEER’S CERTIFICATION:
I hereby certify that the Specifications contained herein were prepared by me or under my direct supervision and that I am a duly licensed professional engineer under the laws of the State of Iowa.

Casey L. Adams, PE  23175  07 December 2021
License Expires:  December 31st, 2022
Pages or sheets covered by this seal:  Divisions 21-27
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LINCOLN SCIENCE & SPED CLASSROOMS UPGRADES

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NOTICE IS HEREBY GIVEN: Sealed proposals will be received by the Supply Chain Analyst of the Des Moines Independent Community School District at his office, Des Moines Independent Community School District, 1917 Dean Avenue, Des Moines, Iowa 50316 until three o’clock p.m. on the 20th day of January 2022, for the construction/repair and/or installation of the following improvement(s):

Bid No. B8725 LINCOLN SCIENCE & SPED CLASSROOMS UPGRADES

Commencing December 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 facility management office 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, telegraphic 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, cashiers 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 Pre-Bid Conference will be held at 2:00 PM on Wednesday, December 15, 2021, at Operations Center, The Harper Room West, 1917 Dean Avenue, Des Moines, Iowa 50316.

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 February 1, 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 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 GUARANTEES

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
DES MOINES INDEPENDENT
COMMUNITY SCHOOL DISTRICT
LINCOLN SCIENCE & SPED CLASSROOMS UPGRADES

INSTRUCTIONS TO BIDDERS

DOCUMENT 00100 – Page 4

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 representatives. 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 ____________________________


8. Do you currently have any legal action pending which could impact your ability to perform this Project? __________ If yes, please explain: ____________________________
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: Lincoln Science & SPED Classrooms Upgrades

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
PART 1 - GENERAL

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

1. Bids Due: January 20, 2022
2. Notice of Award: February 1, 2022
3. Construction Start: June 6, 2022
4. Substantial Completion: August 12, 2022
5. Final Completion: October 28, 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

The following general phasing concept has been developed in order to provide the Contractor with an overall concept of how the phasing will be required for work on this Project. The District will work with the General Contractor, awarded the Project, to define the final detailed schedule of when work will 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:

- Work to be coordinated through the Owner’s representative.
- Work can be done on all days between the start of construction and substantial completion. However, staff and students may be present on-site during this time. Contractor to coordinate with owner to schedule construction to work around staff and student activities. Staff and student scheduled activities are not anticipated to interfere with contractor’s access to jobsite.
- Any work that would produce dust, debris, noise or vibrations that would adversely impact the adjacent classrooms shall be done during non-class hours or non-school days.
- All hauling of equipment and materials in/out and debris removal must ensure 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.
- 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: cooling systems, 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.
- Construction Start: June 6, 2022 – Based upon no lost days of student instruction due to snow or other uncontrollable events. Start of work is required to be adjusted accordingly.
- Close Out: Completion of Closeout Documents and punch list. – August 12, 2022 – October 28, 2022. All punch list work shall occur after school hours.

END OF DOCUMENT
1.1 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, childcare 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.

1.2 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.
C. Type or print the signer's name and title in the spaces provided below the signature.

D. Date the Form in the spaces provided.

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

F. Have the Bid Proposal Notarized.

G. Completed Proposal form to be included in the INNER envelope.

3.2 TSB (Targeted Small Business Participation) FORM (DOCUMENT 00312)
Indicate participation on bid form. Low bidder to provide participation documents along with 24 HR information.

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, bidder’s 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. Telephoned, 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: LINCOLN SCIENCE & SPED CLASSROOMS UPGRADES

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

COVERING BID NO: B8725

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.

The undersigned further acknowledges receipt of the following Addenda:

Contractor Name
BASE BID - BID NO. B8725  LINCOLN SCIENCE & SPED CLASSROOMS UPGRADES

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

the lump sum price of: ____________________________

$__________________________, 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 – NONE

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

Contractor Name

PROPOSAL FORM TO BE SUBMITTED IN INNER ENVELOPE
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: ___________________________________________________________________

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)

<table>
<thead>
<tr>
<th>TSB Company Name</th>
<th>Address</th>
<th>Description of Work</th>
<th>Dollar Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.______________________________</td>
<td>$____________________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.______________________________</td>
<td>$____________________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.______________________________</td>
<td>$____________________</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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
THIS PAGE INTENTIONALLY LEFT BLANK
Bidder Status Form

To be completed by all bidders

Part A

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

Part B

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

<table>
<thead>
<tr>
<th>Dates:</th>
<th>Address:</th>
<th>City, State, Zip:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

You may attach additional sheet(s) if needed.

To be completed by non-resident bidders

Part C

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

Part D

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.
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 Acknowledgement 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 Acknowledgement 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.
BID BOND

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

PROPOSAL FORM TO BE SUBMITTED IN OUTER ENVELOPE
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 to Proceed, and receipt of requisite bid documents, each Contractor shall commence work in accordance with the conditions contained in the Notice to Proceed.
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 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 therefor. 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:
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: $
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.

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):

______________________________________________________________________________
______________________________________________________________________________

together with the obligations of the Contract Documents, as defined in the Construction Agreement, all of which documents are collectively referred to herein as the "Contract" and are incorporated by this reference.

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) ______________________________________

(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
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
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## GENERAL CONDITIONS OF THE CONTRACT

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GC - 1.00  **CONTRACT DOCUMENTS**

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.

GC - 2.00  **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 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.

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

GC - 3.00 ORAL STATEMENTS

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.

GC - 4.00 REFERENCE STANDARDS
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.

GC - 5.00 ITEMS COVERED BY CONTRACT PRICE

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.
GC - 8.00  **SHOP DRAWINGS AND SAMPLES**

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 sepias 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.

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.

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.

GC - 18.00 CLAIMS FOR EXTRA COST OR ADDITIONAL TIME

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.

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 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.

GC - 23.00  
**PAYMENT**

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 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.

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 Contract Documents. 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.

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.

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.

**GC- 38.00  DAMAGE TO UTILITIES**

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.

**GC - 39.00  PROJECT SIGN**

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.

**GC - 40.00  BLASTING**

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.

**GC - 41.00  HISTORICAL DATA**
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.
GC - 49.00  INDEMNIFICATION

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.

GC - 50.00  LIQUIDATED DAMAGES FOR DELAY IN COMPLETION

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.
GC – 51.00  SUBSTANTIAL COMPLETION

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 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.

**GC - 56.00  SOIL TEST REPORT**

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.

GC - 57.00  EXPEDITING MATERIALS

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.

GC - 58.00  MISCELLANEOUS KEYS, SWITCHES, ETC.

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.

GC - 59.00  ELECTRONIC COMMUNICATIONS

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
PART 1 - GENERAL

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: 2600 SW 9th Street, Des Moines, Iowa 50315.

B. The project includes a renovation of the existing library into new SPED classrooms and upgrades to existing science rooms 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 wavers 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:

PROJECT NAME: LINCOLN SCIENCE & SPED CLASSROOMS UPGRADES

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  

Des Moines Public Schools: PROJECT: APPLICATION NO.: Distribution to:  
1917 Dean Avenue PROJECT NO.:  
Des Moines, IA 50316 PERIOD TO:  
FROM CONTRACTOR: x DMPS & Architect  
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) $0.00
   b. 1% of Stored Material (Column F on G703) $0.00
   Total Retainage (Line 5a + 5b or Column G on G703) $0.00
6. TOTAL EARNED LESS RETAINAGE (Line 4 less Line 5 Total) $ -
7. LESS PREVIOUS CERTIFICATES FOR PAY (Line 6 from prior Certificate) $ - $0.00
8. CURRENT PAYMENT DUE
9. BALANCE TO FINISH, INCLUDING RETAINAGE (Line 3 less Line 6) $ -

CHANGE ORDER SUMMARY  ADDITIONS DEDUCTIONS
Total changes approved in previous months by Owner $ - $ - $ -
Total approved this Month $ - $ - $ -
TOTALS $ - $ - $ -
NET CHANGES by Change Order $ - $ - $ -

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: ____________________________ Date: ________________

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 $ -

-Architect's signature
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.

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.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITEM NO.</td>
<td>DESCRIPTION OF WORK</td>
<td>SCHEDULED VALUE</td>
<td>WORK COMPLETED FROM PREVIOUS APPLICATION (D+E)</td>
<td>THIS PERIOD</td>
<td>PRESENTLY STORED (NOT IN D OR E)</td>
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| PROJECT TOTAL | | | | | | | | | |
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.
   3 Section 01700 - Contract Closeout: Project Record Documents.

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
PART 1 - GENERAL

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. None

PART 2 – PRODUCTS
   Not used

PART 3 – EXECUTION
   Not used

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PART 1 - GENERAL

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.

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 airtight 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
PART 1 - GENERAL

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
PART 1 - GENERAL

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


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
PART 1 - GENERAL

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 LINCOLN SCIENCE & SPED CLASSROOMS UPGRADES 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 Contractor.

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

PART 3 - EXECUTION
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 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
PART 1 - GENERAL

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:
   a. Inspect placement of trench backfill.
   b. Test compaction of trench backfill.

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.

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
PART 1 - GENERAL

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 portions of the building outside of the work area that are impacted by dust and debris generated from completing work activities.

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 severed.

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.
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
PART 1 - GENERAL

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.
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.
PRE-BID REQUEST SUBSTITUTION FORM

To: Studio MELEE
    139 Fourth Street
    West Des Moines, IA 50265

PROJECT: LINCOLN SCIENCE & SPED CLASSROOMS UPGRADES

Email: Christopher Wernimont, AIA, chris@studiomelee.com

We hereby submit for your consideration the following product as substitute for specified item for the above project:

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<th>Section</th>
<th>Page</th>
<th>Paragraph/Line</th>
<th>Specified Item</th>
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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 ____________________________
Submitted by:

__________________________
Signature

__________________________
Firm

Studio MELEE
Address
139 Fourth Street, WDM, IA 50265

By: _______________________
Date: _______________________
Remarks: ____________________

Date: _______________________
Telephone: ___________________

For Architect’s Use Only:

__Accepted    __Accepted as Noted

__Not Accepted   __Received Too Late

END OF SECTION
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 LINCOLN SCIENCE & SPED CLASSROOMS UPGRADES 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

ARCHITECT

Studio MELEE

Christopher Wernimont, AIA

PROJECT: Lincoln Science & SPED Classrooms Upgrades

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 __Lincoln Science & SPED Classrooms Upgrades__ 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_.

____________________________   ____________________ _
(Entity)      (Date)

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 its 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.: B8725

Des Moines Independent Community School District
2100 Fleur Drive
Des Moines, IA 50321

PROJECT: Lincoln Science & SPED Classrooms Upgrades

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

Christopher Wernimont, AIA
139 Fourth Street
West Des Moines, IA 50265

PROJECT: Lincoln Science & SPED Classrooms Upgrades

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.

Contractor
By
Date

Architect
By
Date

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:

Des Moines Independent Community School District

This Document shall not become Valid until signed by the Contractor, Architect, and Owner.
# CERTIFICATE OF FINAL ACCEPTANCE

**PROJECT:** Lincoln Science & SPED Classrooms Upgrades  
**PROJECT NO:** B8725

**FROM:** OWNER: Des Moines Independent  
Community School District  
2100 Fleur Drive  
Des Moines, IA 50321

**TO CONTRACTOR:**

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

<table>
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<th>Contractor</th>
<th>By</th>
<th>Date</th>
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<tr>
<td>Studio MELEE</td>
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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**

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: Lincoln Science & SPED Classrooms Upgrades

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the Surety, on bond of the 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):
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:  B8725

PROJECT:  Lincoln Science & SPED Classrooms Upgrades  

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

____________________________________________________________________
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

PROJECT NO: B8725

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 #  B8725  for project  Lincoln Science & SPED Classrooms Upgrade  at  Abraham Lincoln High 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.
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 interior site elements.
3. Salvage of existing items to be reused, recycled, or turned over to the Owner.

B. Related Requirements:

1. None

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 for reuse, if indicated.

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.
1.5 PREINSTALLATION MEETINGS

A. Division 1- General Requirements: Schedules and Liquidated Damages

B. Pre-demolition 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 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. 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 as applicable.

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.

1. Before selective demolition, Owner will remove the following items:

   a. Wall & ceiling mounted projectors, where applicable.

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 material remediation is handled by the owner in a separate contract.

   2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.

   3. If unanticipated asbestos is suspected, stop work in the area of potential hazard, shut off fans and other air handlers 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.

E. Storage or sale of removed items or materials on-site is not permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

   1. Maintain smoke, fire sprinkler and fire-alarm 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.

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 pre-construction photographs.

1. Inventory and record the condition of items to be removed and salvaged. Provide photographs 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 01500 "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. Coordinate with owner’s schedule to shut off any services, systems, and utilities.
   2. Arrange to shut off indicated services, systems, and utilities with utility companies.
   3. 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.
   4. 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. DMPS will provide container for storage and will receive captured refrigerant from the contractor after removal.
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 Section 01500 "Construction Facilities and Temporary 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 01500 "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.
9. Dispose of demolished items and materials promptly.

B. Removed and Salvaged Items:
   1. Clean salvaged items.
   2. Store items in a secure area until delivery to Owner.
   3. Transport items to Owner's storage area on-site or off-site.
   4. Protect items from damage during transport and storage.

C. 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.

D. 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 reinstalled 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. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and remove masonry between saw cuts. Provide full masonry units that match existing for patching locations. No partial masonry units will be accepted.

C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

D. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings."

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.

B. END OF SECTION 024119
SECTION 055000 - METAL FABRICATIONS

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. Slotted channel framing (uni-strut)
2. Surface-Mounted metal corner guards

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.

1.4 ACTION SUBMITTALS

A. Product Data: For the following:

1. Metal corner guards.
2. Adhesive tape.

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 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

1.6 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.

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 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. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.

1. Hot-dipped galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

C. Eyebolts: ASTM A 489.

D. Machine Screws: ASME B18.6.3.

E. Lag Screws: ASME B18.2.1.


H. 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.
I. Slotted-Channel Inserts: Cold-formed, hot-dip galvanized-steel box channels (struts) complying with MFMA-4, 1-5/8 by 7/8 inches by length indicated with anchor straps or studs not less than 3 inches (75 mm) long at not more than 8 inches o.c. Provide with temporary filler and tee-head bolts, complete with washers and nuts, all zinc-plated to comply with ASTM B 633, Class Fe/Zn 5, as needed for fastening to inserts.

2.3 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 exposed work with accurate angles and surfaces and straight edges.

D. 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.

E. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

F. 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.

2.4 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 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 located exterior or in exterior walls.

D. Prime miscellaneous framing and supports with zinc-rich primer where indicated.
2.5 SLOTTED CHANNEL FRAMING (UNI-STRUT)

A. Slotted Channel Framing: Cold-formed metal box channels (uni-struts) complying with MFMA-4.
   1. Size of Channels: As indicated.
   2. Material: Galvanized steel, ASTM A 653/A 653M, structural steel, Grade 33, with G90 coating; 0.108-inch nominal thickness.

2.6 SURFACE-MOUNTED METAL CORNER GUARDS (SST CORNER GUARDS)

A. Manufacturers: Subject to compliance with requirement, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. Construction Specialties, Inc.
   2. InPro Corporation
   3. WallGuard.com

B. Fabrication: fabricate from one-piece, formed or extruded metal with formed edges; with 90 or 135 degree turn to match wall condition.

C. Material: Stainless steel, Type 304
   1. Thickness: Minimum 0.0625 inch
   2. Finish: Directional satin, No. 4

D. Wing Size: Nominal 2.5" by 2.5" inches

E. Height: 48"

F. Corner Radius: 1/8 inch

G. Mounting: Field applied heavy-duty adhesive.

2.7 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.
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-dipped 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 ADJUSTING AND CLEANING

A. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 099123 "Painting."

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 055000
SECTION 061000 - ROUGH CARPENTRY

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. Fire-treated wood blocking and nailers.
      2. Fire-treated wood furring.

1.3 DEFINITIONS
   A. Exposed Framing: Framing not concealed by other construction.
   B. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.
   C. Lumber grading agencies, and the abbreviations used to reference them, include the following:
      2. NLGA: National Lumber Grades Authority.
      3. RIS: Redwood Inspection Service.
      5. WCLIB: West Coast Lumber Inspection Bureau.

1.4 ACTION SUBMITTALS
   A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
      1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with

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requirements. Indicate type of preservative used and net amount of preservative retained.

2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.

3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.

4. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

B. Fastener Patterns: Full-size templates for fasteners in exposed framing.

1.5 INFORMATIONAL SUBMITTALS

A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

B. Evaluation Reports: For the following, from ICC-ES:

1. Fire-retardant-treated wood.
2. Power-driven fasteners.
4. Expansion anchors.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
3. Provide dressed lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 15 percent unless otherwise indicated.

2.2 FIRE-RETARDANT-TREATED MATERIALS

A. 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.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, and 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. Use treatment that does not promote corrosion of metal fasteners.
2. Exterior type is suitable for both exterior and interior applications. Interior type is only for interior applications.
3. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
4. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.

C. Kiln-dry lumber after treatment to a maximum moisture content of 15 percent.

D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.

E. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.

F. Application: Treat all rough carpentry unless otherwise indicated.

1. Concealed blocking and nailers.
2. Furring.
2.3 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails, Brads, and Staples: ASTM F 1667.


D. Wood Screws: ASME B18.6.1.

E. Lag Bolts: ASME B18.2.1.

F. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.

G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry assemblies and equal to four times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.

   2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

2.4 MISCELLANEOUS MATERIALS

A. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to suit width of sill members indicated.

B. Adhesives for Gluing Furring to Concrete or Masonry: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

C. Install sill sealer gasket to form continuous seal between sill plates and foundation walls.

D. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:
   1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
   2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal thickness.
   3. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.

E. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

F. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
   1. NES NER-272 for power-driven fasteners.
   3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.

G. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.
   1. Comply with indicated fastener patterns where applicable. Before fastening, mark fastener locations, using a template made of sheet metal, plastic, or cardboard.
   2. Use finishing nails unless otherwise indicated. Countersink nail heads and fill holes with wood filler.
   3. Use common nails unless otherwise indicated. Drive nails snug but do not countersink nail heads.

3.2 WOOD GROUND, BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
B.Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

C. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

3.3 WOOD FURRING INSTALLATION

A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.

3.4 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000
SECTION 062023 - INTERIOR FINISH CARPENTRY

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. Interior trim, wall base and shoe for opaque finish.

B. Related Requirements:

1. Section 099123 "Painting" for priming and backpriming of interior finish carpentry.
2. Section 061000 "Rough Carpentry" for furring, blocking, and other carpentry work not exposed to view.
3. Section 125653 “Lab Casework” for infill of existing casework sections.

1.3 DEFINITIONS

A. MDF: Medium-density fiberboard.

B. MDO: Plywood with a medium-density overlay on the face.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials, dimensions, profiles, textures, and colors and include construction and application details.

1. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.
2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced before shipment to Project site to levels specified.

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3. Include copies of warranties from chemical-treatment manufacturers for each type of treatment.

1.5 ACTION SUBMITTALS

A. Samples for Initial Selection: For each type of product involving selection of colors, profiles, or textures.

B. Samples for Verification:
   1. For each finish system and color of paneling & trim products with factory-applied finish provide 12” long sample.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Stack materials flat with spacers between each bundle to provide air circulation. Protect materials from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

B. Deliver interior finish carpentry materials only when environmental conditions meet requirements specified for installation areas. If interior finish carpentry materials must be stored in other than installation areas, store only where environmental conditions meet requirements specified for installation areas.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install interior finish carpentry materials until building is enclosed and weatherproof, wet work in space is completed and nominally dry, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.

   1. Indications that materials are wet, or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
   2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Lumber: DOC PS 20 and the following grading rules:
5. WCLIB: West Coast Lumber Inspection Bureau, Standard No. 17, "Grading Rules for West Coast Lumber."
6. WWPA: Western Wood Products Association, "Western Lumber Grading Rules."

B. Factory mark each piece of lumber with grade stamp of inspection agency indicating grade, species, moisture content at time of surfacing, and mill.

1. For exposed lumber, mark grade stamp on end or back of each piece


D. Hardboard: AHA A135.4.

E. MDF: ANSI A208.2, Grade 130

2.2 INTERIOR STANDING AND RUNNING TRIM FOR OPAQUE FINISH

A. Grade: Premium

B. Wood Species: Red Oak

C. Profile: match existing profiles at each location.

2.3 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Fire-retardant-treated softwood lumber, kiln dried to less than 15 percent moisture content.

B. Fasteners for Interior Finish Carpentry: Nails, screws, and other anchoring devices of type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible.

C. Glue: Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use.

1. Wood glue shall have a VOC content of 30 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

D. Multipurpose Construction Adhesive: Formulation complying with ASTM D 3498 that is recommended for indicated use by adhesive manufacturer.
1. Adhesive shall have a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

B. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours unless longer conditioning is recommended by manufacturer.

3.3 INSTALLATION, GENERAL

A. Do not use materials that are unsound, warped, improperly treated, or finished, inadequately seasoned, too small to fabricate with proper jointing arrangements, or with defective surfaces, sizes, or patterns.

B. Install interior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.

1. Scribe and cut interior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.

2. Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.

3. Install to tolerance of 1/8 inch in 96 inches for level and plumb. Install adjoining interior finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.

4. Install stairs with no more than 3/16-inch variation between adjacent treads and risers and with no more than 3/8-inch variation between largest and smallest treads and risers within each flight.

5. Coordinate interior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate interior finish carpentry.
3.4 ADJUSTING AND CLEANING

A. Replace interior finish carpentry that is damaged or does not comply with requirements. Interior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing. Adjust joinery for uniform appearance.

B. Repair damaged and defective paneling, where possible, to eliminate defects; where not possible to repair, replace paneling. Adjust for uniform appearance.

C. Clean interior finish carpentry on exposed and semi-exposed surfaces. Restore damaged or soiled areas and touch up factory-applied finishes.

D. Clean paneling on exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

3.5 PROTECTION

A. Protect installed products from damage from weather and other causes during construction.

B. Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged.

1. Indications that materials are wet, or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 062023
SECTION 078413 - PENETRATION FIRESTOPPING

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. Penetrations in fire-resistance-rated walls.
2. Penetrations in horizontal assemblies.

B. Related Sections:

1. Section 078446 "Fire-Resistive Joint Systems" for joints in or between fire-resistance-rated construction.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Product Schedule: For each penetration fire stopping system. Include location and design designation of qualified testing and inspecting agency.

1. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration fire stopping condition, submit illustration, with modifications marked, approved by penetration fire stopping manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.
B. Installer Certificates: From Installer indicating penetration fire stopping has been installed in compliance with requirements and manufacturer's written recommendations.

C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for penetration fire stopping.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A firm experienced in installing penetration fire stopping similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its penetration fire stopping products to Contractor or to Installer engaged by Contractor does not in itself confer qualification on buyer.

B. Fire-Test-Response Characteristics: Penetration fire stopping shall comply with the following requirements:

1. Penetration fire stopping tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.
2. Penetration fire stopping is identical to those tested per testing standard referenced in "Penetration Fire stopping" Article. Provide rated systems complying with the following requirements:
   a. Penetration fire stopping products bear classification marking of qualified testing and inspecting agency.
   b. Classification markings on penetration fire stopping correspond to designations listed by the following:
      1) UL in its "Fire Resistance Directory."
      2) FM Global in its "Building Materials Approval Guide."

C. Pre-installation Conference: Conduct conference at project site.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not install penetration fire stopping when ambient or substrate temperatures are outside limits permitted by penetration fire stopping manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.

B. Install and cure penetration fire stopping per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.
1.7 COORDINATION

A. Coordinate construction of openings and penetrating items to ensure that penetration fire stopping is installed according to specified requirements.

B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration fire stopping.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Grace Construction Products.
2. Hilti, Inc.
4. 3M Fire Protection Products.
6. USG Corporation.

2.2 PENETRATION FIRESTOPPING

A. Provide penetration fire stopping that is produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration fire stopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.

B. Penetrations in Fire-Resistance-Rated Walls: Provide penetration fire stopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.

1. Fire-resistance-rated walls include fire walls, fire-barrier walls, smoke-barrier walls, and fire partitions. Refer to code plan and/or building plans for location of required fire-resistance-rated walls.
2. F-Rating: Not less than the fire-resistance rating of constructions penetrated.

C. Penetrations in Horizontal Assemblies: Provide penetration fire stopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.

1. Horizontal assemblies include floor/ceiling assemblies.
2. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
3. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.

D. Penetrations in Smoke Barriers: Provide penetration fire stopping with ratings determined per UL 1479.

1. L-Rating: Not exceeding 5.0 cfm/sq. ft. of penetration opening at 0.30-inch wg at both ambient and elevated temperatures.

E. W-Rating: Provide penetration fire stopping showing no evidence of water leakage when tested according to UL 1479.

F. Exposed Penetration Fire stopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

G. Accessories: Provide components for each penetration fire stopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration fire stopping manufacturer and approved by qualified testing and inspecting agency for fire stopping indicated.

1. Permanent forming/damming/backing materials, including the following:
   a. Slag-wool-fiber or rock-wool-fiber insulation.
   b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
   c. Fire-rated form board.
   d. Fillers for sealants.

2. Temporary forming materials.
5. Steel sleeves.

2.3 FILL MATERIALS

A. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.

B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.

C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized-steel sheet.

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E. Intumescent Putties: Non-hardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.

F. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.

G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a non-shrinking, homogeneous mortar.

H. Pillows/Bags: Reusable heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives. Where exposed, cover openings with steel-reinforcing wire mesh to protect pillows/bags from being easily removed.

I. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, non-shrinking foam.

J. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and non-sag formulation for openings in vertical and sloped surfaces, unless indicated fire stopping limits use of non-sag grade for both opening conditions.

2.4 MIXING

A. For those products requiring mixing before application, comply with penetration fire stopping manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.
3.2 PREPARATION

A. Surface Cleaning: Clean out openings immediately before installing penetration fire stopping to comply with manufacturer's written instructions and with the following requirements:

1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration fire stopping.
2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration fire stopping.
3. Remove loose particles remaining from cleaning operation.

B. Priming: Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent penetration fire stopping from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing fire stopping's seal with substrates.

3.3 INSTALLATION

A. General: Install penetration fire stopping to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.

B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire stopping.

C. Install fill materials for fire stopping by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.
3.4 IDENTIFICATION

A. Identify penetration fire stopping with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of fire stopping edge so labels will be visible to anyone seeking to remove penetrating items or fire stopping. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:

1. The words "Warning - Penetration Fire stopping - Do Not Disturb. Notify Building Management of Any Damage."
2. Contractor's name, address, and phone number.
3. Designation of applicable testing and inspecting agency.
4. Date of installation.
5. Manufacturer's name.
6. Installer's name.

3.5 FIELD QUALITY CONTROL

A. Authority having jurisdiction will inspect penetration fire stopping.

B. Where deficiencies are found or penetration fire stopping is damaged or removed because of testing, repair or replace penetration fire stopping to comply with requirements.

C. Proceed with enclosing penetration fire stopping with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration fire stopping manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation that ensure that penetration fire stopping is without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration fire stopping and install new materials to produce systems complying with specified requirements.

END OF SECTION 078413
SECTION 078446 - FIRE-RESISTIVE JOINT SYSTEMS

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. Joints in or between fire-resistance-rated constructions.

B. Related Sections:

1. Section 078413 "Penetration Firestopping" for penetrations in fire-resistance-rated walls, horizontal assemblies, and smoke barriers.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Product Schedule: For each fire-resistive joint system. Include location and design designation of qualified testing agency.

1. Where Project conditions require modification to a qualified testing agency's illustration for a particular fire-resistive joint system condition, submit illustration, with modifications marked, approved by fire-resistive joint system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Installer Certificates: From Installer indicating fire-resistive joint systems have been installed in compliance with requirements and manufacturer's written recommendations.
C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for fire-resistive joint systems.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A firm experienced in installing fire-resistive joint systems similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its fire-resistive joint system products to Contractor or to Installer engaged by Contractor does not in itself confer qualification on buyer.

B. Fire-Test-Response Characteristics: Fire-resistive joint systems shall comply with the following requirements:

1. Fire-resistive joint system tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.
2. Fire-resistive joint systems are identical to those tested per testing standard referenced in "Fire-Resistive Joint Systems" Article. Provide rated systems complying with the following requirements:
   a. Fire-resistive joint system products bear classification marking of qualified testing agency.
   b. Fire-resistive joint systems correspond to those indicated by reference to designations listed by the following:
      1) UL in its "Fire Resistance Directory."

C. Pre-installation Conference: Conduct conference at project site.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not install fire-resistive joint systems when ambient or substrate temperatures are outside limits permitted by fire-resistive joint system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.

B. Install and cure fire-resistive joint systems per manufacturer's written instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.

1.7 COORDINATION

A. Coordinate construction of joints to ensure that fire-resistive joint systems are installed according to specified requirements.

B. Coordinate sizing of joints to accommodate fire-resistive joint systems.
PART 2 - PRODUCTS

2.1 FIRE-RESISTIVE JOINT SYSTEMS

A. Where required, provide fire-resistive joint systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which fire-resistive joint systems are installed. Fire-resistive joint systems shall accommodate building movements without impairing their ability to resist the passage of fire and hot gases.

B. Joints in or between Fire-Resistance-Rated Construction: Provide fire-resistive joint systems with ratings determined per ASTM E 1966 or UL 2079:

1. Joints include those installed in or between fire-resistance-rated walls and floor or floor/ceiling assemblies.
2. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of construction they will join.
3. 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. Grace Construction Products.
   b. Hilti, Inc.
   c. Johns Manville.
   d. 3M Fire Protection Products.
   f. USG Corporation.

C. Exposed Fire-Resistive Joint Systems: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

D. Accessories: Provide components of fire-resistive joint systems, including primers and forming materials, that are needed to install fill materials and to maintain ratings required. Use only components specified by fire-resistive joint system manufacturer and approved by the qualified testing agency for systems indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.
3.2 PREPARATION

A. Surface Cleaning: Clean joints immediately before installing fire-resistive joint systems to comply with fire-resistive joint system manufacturer's written instructions and the following requirements:

1. Remove from surfaces of joint substrates foreign materials that could interfere with adhesion of fill materials.
2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with fill materials. Remove loose particles remaining from cleaning operation.
3. Remove laitance and form-release agents from concrete.

B. Priming: Prime substrates where recommended in writing by fire-resistive joint system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent fill materials of fire-resistive joint system from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing fire-resistive joint system's seal with substrates.

3.3 INSTALLATION

A. General: Install fire-resistive joint systems to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.

B. Install forming materials and other accessories of types required to support fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire-resistive joint system.

C. Install fill materials for fire-resistive joint systems by proven techniques to produce the following results:

1. Fill voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.
2. Apply fill materials so they contact and adhere to substrates formed by joints.
3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.
3.4 IDENTIFICATION

A. Identify fire-resistive joint systems with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of joint edge so labels will be visible to anyone seeking to remove or penetrate joint system. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:

2. Contractor's name, address, and phone number.
3. Designation of applicable testing agency.
4. Date of installation.
5. Manufacturer's name.
6. Installer's name.

3.5 FIELD QUALITY CONTROL

A. Inspecting Agency: Authority having jurisdiction will inspect fire-resistive joint systems.

B. Where deficiencies are found or fire-resistive joint systems are damaged or removed due to testing, repair or replace fire-resistive joint systems so they comply with requirements.

C. Proceed with enclosing fire-resistive joint systems with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTING

A. Clean off excess fill materials adjacent to joints as the Work progresses by methods and with cleaning materials that are approved in writing by fire-resistive joint system manufacturers and that do not damage materials in which joints occur.

B. Provide final protection and maintain conditions during and after installation that ensure fire-resistive joint systems are without damage or deterioration at time of Substantial Completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or deteriorated fire-resistive joint systems immediately and install new materials to produce fire-resistive joint systems complying with specified requirements.

C. END OF SECTION 078446
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. Latex joint sealants.

B. Related Sections:

1. Section 078413 "Penetration firestopping" for sealing joints in fire-resistance-rated construction.
2. Section 078446 "Fire-Resistive Joint Systems" for sealing joints in fire-resistance-rated construction.
3. Section 088000 "Glazing" for glazing sealants.
4. Section 092900 "Gypsum Board" for sealing perimeter joints.
5. Section 095123 "Acoustical Tile Ceilings" for sealing edge moldings at perimeters with acoustical sealant.

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. 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.

D. 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.

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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 non-staining 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. Joints between science and FCS countertops and wall surfaces
4. On non-porous surfaces such as tile, glass, and metal.

B. Single-Component, Non-sag, Neutral-Curing, clear 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 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. White for painted surfaces; colors as selected for non-painted surfaces.

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.

2.4 JOINT SEALANT BACKING

A. General: Provide sealant backings of material that are non-staining; 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.

2.5 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: Non-staining, 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.

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.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by 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.
C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

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 Non-sag 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 recessed 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 FRAMES

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 hollow-metal work.

B. Related Requirements:

1. Section 081416 "Flush Wood Doors" for wood doors installed in hollow-metal frames.
2. Section 087100 "Door Hardware" for recessed or mortised hardware.

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. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
2. Locations of reinforcement and preparations for hardware.
3. Details of each different wall opening condition.
4. Details of anchorages, joints, field splices, and connections.
5. Details of accessories.
6. Details of moldings, removable stops, and glazing. Identify secure side of openings.

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:
2.2 REGULATORY REQUIREMENTS

A. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings and temperature-rise limits indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

1. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

2.3 INTERIOR FRAMES

A. Construct interior frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Commercial Frames: NAAMM-HMMA 861. At locations indicated in the Door and Frame Schedule.

1. Physical Performance: Level A according to SDI A250.4.

2. 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.

3. Exposed Finish: Prime & Field Paint as shown on Drawings.

2.4 FRAME ANCHORS

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-dipped galvanized according to ASTM A 153/A 153M, Class B.

E. Inserts, Bolts, and Fasteners: Hot-dipped 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.

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 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. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
2. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
3. 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.
4. 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.
5. Head Anchors: Two anchors per head for frames more than 42 inches wide and mounted in metal-stud partitions.
6. 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.

C. Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.

D. 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 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.

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. 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 frames to receive non-templated, 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 jamb 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.

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.

END OF SECTION 081113
SECTION 081416 - FLUSH WOOD DOORS

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. Solid-core doors with wood-veneer faces.
2. Factory finishing flush wood doors.
3. Factory fitting flush wood doors to frames and factory machining for hardware.

B. Related Sections:

1. Section 088000 "Glazing" for glass view panels in flush wood doors.
2. Section 087100 "Door Hardware".

1.3 ACTION SUBMITTALS

A. Product Data: For each type of door indicated. Include details of core and edge construction and trim for openings.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.

1. Indicate dimensions and locations of mortises and holes for hardware.
2. Indicate dimensions and locations of cutouts.
3. Indicate requirements for veneer matching.
4. Samples for Initial Selection: For factory-finished doors. For each wood species and transparent finish, provide set of three samples showing typical range of color and grain to be expected in the finished work.
5. Indicate fire-protection ratings for fire-rated doors.

C. Samples for Verification:
1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish.
2. Frames for light openings, 6 inches long, for each material, type, and finish required.

1.4 INFORMATIONAL SUBMITTALS

A. Warranty: Sample of special warranty.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain flush wood doors from single manufacturer.
B. Quality Standard: In addition to requirements specified, comply with AWI's "Architectural Woodwork Quality Standards Illustrated."
   1. Provide AWI Quality Certification Labels or an AWI letter of licensing for Project indicating that doors comply with requirements of grades specified.
C. Preinstallation Conference: Conduct conference at Project site.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.
B. Package doors individually in cardboard cartons and wrap bundles of doors in plastic sheeting.
C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
a. Warping (bow, cup, or twist) more than 1/8 inch in a 42-by-84-inch section.
b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.

2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.

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. Curries; an Assa Abloy Group company.
2. Masonite company.
3. Algoma Hardwoods, Inc.
4. Eggers Industries.
5. Graham; an Assa Abloy Group company.
7. Mohawk Flush Doors, Inc.; a Masonite company.
8. VT Industries Inc.

2.2 DOOR CONSTRUCTION, GENERAL

A. Low-Emitting Materials: Fabricate doors with adhesives and composite wood products that do not contain urea formaldehyde.

B. WDMA I.S.1-A Performance Grade: Heavy-Duty.

C. Structural-Composite-Lumber-Core Doors:

   a. Screw Withdrawal, Face: 700 lbf.
   b. Screw Withdrawal, Edge: 400 lbf.

2.3 VENEERED-FACED DOORS FOR TRANSPARENT FINISH

A. Solid-Core Doors:

1. Grade: Premium, with Grade A faces.
2. Species: Red Oak.
3. Cut: Plain sliced.

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5. Assembly of Veneer Leaves on Door Faces: Center-balance match.
6. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
7. Room Match: Match door faces within each separate room or area of building. Faces do not need to match where they are separated by 10 feet or more.
8. Exposed Vertical and Top Edges: Same species as faces.
11. Construction: Seven plies. Stiles and rails are bonded to core, then entire unit abrasive planed before veneering. Faces are bonded to core using a hot press.
12. WDMA I.S.1-A Performance Grade: Heavy-Duty.

2.4 LOUVERS AND LIGHT FRAMES

A. Wood Beads for Light Openings in Wood Doors: Provide manufacturer's standard wood beads as follows unless otherwise indicated.

1. Wood Species: Same species as door faces.
2. Profile: Flush rectangular beads.

2.5 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.

B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.

1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.

C. Openings: Cut and trim openings through doors in factory.

1. Light Openings: Trim openings with moldings of material and profile indicated.
2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Section 088000 "Glazing".

2.6 FACTORY FINISHING

A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.

1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.
B. Finish doors at factory.

C. Transparent Finish:
   1. Grade: Premium.
   2. Finish: AWI catalyzed polyurethane system.
   3. Staining: As selected by Architect from manufacturer's full range.
   4. Effect: Open-grain finish.
   5. Sheen: Semigloss.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and installed door frames before hanging doors.
   1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
   2. Reject doors with defects.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Hardware: For installation, see Section 087100 "Door Hardware."

B. Installation Instructions: Install doors to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.

C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
   1. Clearances: Provide 1/8 inch at heads, jambs, and between pairs of doors. Provide 1/8 inch from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch from bottom of door to top of threshold unless otherwise indicated.
   2. Bevel non-fire-rated doors 1/8 inch in 2 inches at lock and hinge edges.

D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

E. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.
3.3 ADJUSTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 081416
SECTION 083113 - ACCESS DOORS AND FRAMES

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. Access doors and frames for walls and ceilings.

1.3 RELATED REQUIREMENTS

1. Section 087100 “Door Hardware” for cylinder & keying of access doors.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, fire ratings, materials, individual components and profiles, and finishes.

B. Shop Drawings:

1. Include plans, elevations, sections, details, and attachments to other work.

PART 2 - PRODUCTS

2.1 ACCESS DOORS AND FRAMES FOR WALLS AND CEILINGS

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated or comparable product by one of the following:
1. Access Panel Solutions.
2. Acudor Products, Inc.
3. Jensen Industries; Div. of Broan-Nutone, LLC.

B. Flush Access Doors with Exposed Flanges

1. Assembly Description: Fabricate door to fit flush to frame. Provide manufacturer’s standard-width exposed flange, proportional to door size.
2. Locations: Ceiling as indicated on drawings.
3. Door Size: As indicated on drawings.
4. Uncoated Steel Sheet for Door: 16 gauge.
5. Frame Material: Same material and thickness as door.
6. Hinges: Manufacturer’s standard.
7. Hardware: Cylinder lock. Key to Owner’s keying system.

2.2 MATERIALS

A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
B. Steel Sheet: Uncoated or electrolytic zinc coated, ASTM A 879/A 879M, with cold-rolled steel sheet substrate complying with ASTM A 1008/A 1008M, Commercial Steel (CS), exposed.
C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum A60 metallic coating.
D. Frame Anchors: Same type as door face.
E. Inserts, Bolts, and Anchor Fasteners: Hot-dipped galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

2.3 FABRICATION

A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.
B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access doors to types of supports indicated.
   1. Provide mounting holes in frames for attachment of units to metal or wood framing.
   2. Provide mounting holes in frame for attachment of masonry anchors.

D. Recessed Access Doors: Form face of panel to provide recess for application of applied finish. Reinforce panel as required to prevent buckling.

E. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.
   1. For cylinder locks, furnish two keys per lock and key all locks alike.
   2. For recessed panel doors, provide access sleeves for each locking device.
      Furnish plastic grommets and install in holes cut through finish.

2.4 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Steel and Metallic-Coated-Steel Finishes:
   1. Factory Prime: Apply manufacturer's standard, fast-curing, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.
   2. Factory Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat, with a minimum dry-film thickness of 1 mil (0.025 mm) for topcoat.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates 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

A. Comply with manufacturer's written instructions for installing access doors and frames.

B. Install doors flush with adjacent finish surfaces or recessed to receive finish material.

3.3 ADJUSTING

A. Adjust doors and hardware, after installation, for proper operation.

B. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

END OF SECTION 083113
SECTION 087100 - DOOR HARDWARE

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. Mechanical door hardware for the following:
   a. Swinging doors.

2. Cylinders for door hardware specified in other Sections.

B. Related Sections:
   1. Section 081113 "Hollow Metal Frames"
   2. Section 081416 "Flush Wood Doors"
   3. Section 083113 “Access Doors and Frames”.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: Details of electrified door hardware, indicating the following:

1. Wiring Diagrams: For power, signal, and control wiring and including the following:
   a. Details of interface of electrified door hardware and building safety and security systems.
   b. Schematic diagram of systems that interface with electrified door hardware.
   c. Point-to-point wiring.
   d. Risers.
   e. Elevations- doors controlled by electrified door hardware.

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2. Operation Narrative: Describe the operation of doors controlled by electrified door hardware.

C. Samples for Initial Selection: For plastic protective trim units in each finish, color, and texture required for each type of trim unit indicated.

D. Other Action Submittals:

1. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication, and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
   a. Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.
   b. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule." Double space entries, and number and date each page.
   c. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.
   d. Content: Include the following information:
      1) Identification number, location, hand, size, and material of each door and frame.
      2) Locations of each door hardware set cross-referenced to Drawings on floor plans and to door and frame schedule.
      3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
      4) Description of electrified door hardware sequences of operation and interfaces with other building control systems.
      5) Fastenings and other pertinent information.
      6) Explanation of abbreviations, symbols, and codes contained in schedule.
      7) Mounting locations for door hardware.
      8) List of related door devices specified in other Sections for each door and frame.

2. Keying Schedule: Prepared by or under the supervision of Installer, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations that are coordinated with the Contract Documents.
1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Hardware Provider and Installer

B. Product Certificates: For electrified door hardware, from the manufacturer.

C. Product Test Reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible routes.

D. Warranty: Special warranty specified in this Section.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of door hardware to include in maintenance manuals. Include final hardware and keying schedule.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers who is available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.

1. Warehousing Facilities: In Project's vicinity.
2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies like those indicated for this Project.

B. Source Limitations: Obtain each type of door hardware from a single manufacturer.

1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

C. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

D. Accessibility Requirements: For door hardware on doors in an accessible route, comply with the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and the ICC/ANSI A117.1.

1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.
2. Comply with the following maximum opening-force requirements:
   a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf applied perpendicular to door.
3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch high.
4. Adjust door closer sweep periods so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.

E. Keying Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." In addition to Owner, Program Manager, Contractor, and Architect, conference participants shall also include Installer's Hardware Consultant and Owner's security consultant. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including, but not limited to, the following:

1. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
2. Preliminary key system schematic diagram.
3. Requirements for key control system.
4. Requirements for access control.
5. Address for delivery of keys.

F. Pre-installation Conference: Conduct conference at project site.

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Inspect and discuss preparatory work performed by other trades.
3. Inspect and discuss electrical roughing-in for electrified door hardware.
4. Review sequence of operation for each type of electrified door hardware.
5. Review required testing, inspecting, and certifying procedures.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.

B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.

1.8 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

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C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

D. Existing Openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation.

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Structural failures including excessive deflection, cracking, or breakage.
   b. Faulty operation of doors and door hardware.
   c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Warranty Period: Five (5) years from date of Substantial Completion, unless otherwise indicated.
   a. Electromagnetic Locks: Five (5) years from date of Substantial Completion.
   b. Exit Devices: Two (2) years from date of Substantial Completion.
   c. Manual Closers: Ten (10) years from date of Substantial Completion.

1.10 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. Provide door hardware for each door as scheduled in Part 3 "Door Hardware Schedule" Article and as indicated on Drawings to comply with requirements in this Section.

1. Door Hardware Sets: Provide quantity, item, size, finish, or color indicated, and named manufacturers' products.

2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.
B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:

1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in Part 3 "Door Hardware Schedule" Article.
2. References to BHMA Designations: Provide products complying with these designations and requirements for description, quality, and function.

2.2 HINGES

A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames. Hinges are to be heavy weight with ball bearings. Doors wider than 3' are required to have 4 hinges.

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. Baldwin Hardware Corporation.
   b. Bommer Industries, Inc.
   c. IVES Hardware; an Ingersoll-Rand company.
   d. McKinney Products Company; an ASSA ABLOY Group company.
   e. Stanley Commercial Hardware; Div. of The Stanley Works.

2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on drawings, schedule, or comparable product by one of the following:

   a. Baldwin Hardware Corporation.
   b. Bommer Industries, Inc.
   c. IVES Hardware; an Ingersoll-Rand company.
   d. McKinney Products Company; an ASSA ABLOY Group company.
   e. Stanley Commercial Hardware; Div. of The Stanley Works.


2.3 MECHANICAL LOCKS AND LATCHES

A. All locksets to be grade 1 heavy duty mortise.

B. Mortise locksets:

2.4 LOCK CYLINDERS

A. Keyed cylinders for interior doors:

B. Keyed cylinders for casework:
   1. Provide five tumbler cam locks with chrome finished in chemistry rooms (3260 & 3280) and antique brass finish in science rooms (3250 & 3270). Lock core shall be removable with control key allowing owner to change locks.
   2. Locks shall be keyed alike per each room.

2.5 KEYING

   1. Keying of locks and cylinders throughout project shall be scheduled through a key meeting with Architect, Owner, and hardware supplier. Key schedule shall be prepared and submitted to the Owner for approval. Copies of final key schedule with the biting instructions shall be submitted as part of the Project Record Documents.
   2. Hardware supplier shall verify cylinder type, finish, quantity, etc. for all existing hardware that supplier is supplying cylinders for.
   3. All Locks and cylinders shall be keyed and master keyed as directed by the owner. Distributor to verify proper key system requirements. Keying Schedule must be approved by the Owner prior to ordering locks.
   4. Cylinders, cores, and keying charges shall be supplied and paid for by the contractor.

B. Provide keys as follows:
   1. Change Keys: 10 per lock.
   4. Key blanks: 50 required.

C. Identification: Stamp all (master-type) keys with the following:
   1. Do Not Duplicate.
   2. Key change number (all keys).

2.6 SURFACE CLOSERS

A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use.
Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

1. Manufacturers: Provide LCN 4040XP Series Closers- No Substitutions
   a. Non-Handed, Adjustable closing and latching speeds, adjustable back check, and spring power. Parallel mounting where applicable.
   b. Follow manufacturer’s recommendations for door size and mounting locations.
   c. Unless specified otherwise, provide closer on all labeled doors (See schedule on drawings)
   d. Conform to ADA and ICC/ANSI A-117 requirements at all doors.
   e. Provide non-concealed closers on the interior side of doors, typical.
   f. Attach to wood and metal doors with through bolts.
   g. Provide Ten (10) year warranty.

2. Color/Finish – **Light Bronze**

### 2.7 MECHANICAL STOPS AND HOLDERS

A. Wall-Mounted Stops: BHMA A156.16; aluminum base metal.

1. Manufacturers: Provide Ives stops as required.
   a. Wall: Ives 401 or Ives 402 cast aluminum doorstop with concave rubber bumper and tamper resistant retainer cup.
   b. Floor: Do not use floor stops. Where wall mounted stops will not work properly, provide S-CUCH closer in lieu of stops.

2. Finish shall be **Satin Bronze**, No Substitutions.

### 2.8 DOOR GASKETING

A. Door Gasketing: BHMA A156.22; air leakage not to exceed 0.50 cfm per foot of crack length for gasketing other than for smoke control, as tested according to ASTM E 283; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.

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:

2. Basis-of-Design Product: Provide Pemko S88D. Subject to compliance with requirements, provide product indicated on drawings, schedule, or comparable product by one of the following:

   a. **Hager Companies**.
   b. **National Guard Products, Inc**.
   c. **Zero International**.

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2.9 THRESHOLDS

A. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.
   
   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:
   
   2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on drawings, schedule, or comparable product by one of the following:
      
      a. Hager Companies.
      b. National Guard Products.
      c. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
      d. Rixson Specialty Door Controls; an ASSA ABLOY Group company.
      e. Zero International
      
      3. Finish shall be Mill Finish Bronze.

2.10 METAL PROTECTIVE TRIM UNITS

A. Metal Protective Trim Units: BHMA A156.6; fabricated from 0.050-inch-thick Satin Bronze; with manufacturer's standard machine or self-tapping screw fasteners. Kick plates shall be 2" less in width than the door, typical, height as indicated on drawings.

   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:
   
   2. Basis-of-Design Product: Provide Rockwood K1050. Subject to compliance with requirements, provide product indicated on drawings, schedule, or comparable product by one of the following:
      
      a. Hagar
      b. Baldwin Hardware Corporation.
      c. IVES Hardware; an Ingersoll-Rand company.
      
      3. Finish shall be Satin Bronze US10 or BHMA 612.

2.11 FABRICATION

A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rated labels and as otherwise approved by Architect.

   1. Manufacturer's identification is permitted on rim of lock cylinders only.

B. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition,
temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.

C. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.

1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.

2. Steel Through Bolts: For the following unless door blocking is provided:
   1) Surface hinges to doors.
   2) Closers to doors and frames.
   3) Surface-mounted exit devices.

3. Spacers or Sex Bolts: For through bolting of hollow-metal doors.

4. Fasteners for Wood Doors: Comply with requirements in DHI WDHS.2, "Recommended Fasteners for Wood Doors."

5. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

2.12 FINISHES

A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Supplier to visit project site to verify all existing conditions with general contractor.

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B. Examine doors and frames, with Installer present, for compliance with requirements for
installation tolerances, labeled fire-rated door assembly construction, wall and floor
construction, and other conditions affecting performance.

C. Examine roughing-in for electrical power systems to verify actual locations of wiring
connections before electrified door hardware installation.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and
frames according to ANSI/SDI A250.6.

B. Wood Doors: Comply with DHI WDHS.5 "Recommended Hardware Reinforcement
Locations for Mineral Core Wood Flush Doors."

3.3 INSTALLATION

A. Mounting Heights: Match existing door hardware mounting heights unless indicated on
Drawings to comply with the following unless otherwise indicated or required to comply
with governing regulations.

2. Custom Steel Doors and Frames: HMMA 831.
3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural
Hardware for Wood Flush Doors."

B. Install each door hardware item to comply with manufacturer's written instructions.
Where cutting and fitting are required to install door hardware onto or into surfaces that
are later to be painted or finished in another way, coordinate removal, storage, and
reinstallation of surface protective trim units with finishing. Do not install surface-
mounted items until finishes have been completed on substrates involved.

1. Set units level, plumb, and true to line and location. Adjust and reinforce
attachment substrates as necessary for proper installation and operation.
2. Drill and countersink units that are not factory prepared for anchorage fasteners.
Space fasteners and anchors according to industry standards.

C. Hinges: Install types and in quantities indicated in door hardware schedule but not
fewer than the number recommended by manufacturer for application indicated or one
hinge for every 30 inches of door height, whichever is more stringent, unless other
equivalent means of support for door, such as spring hinges or pivots, are provided.

D. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above
accessible ceilings or in equipment room. Verify location with Architect.
1. Configuration: Provide one power supply for each door opening or the least number of power supplies required to adequately serve doors with electrified door hardware.

E. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Section 079200 "Joint Sealants."

F. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.

G. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

H. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

3.4 FIELD QUALITY CONTROL

A. Hardware supplier will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

3.6 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.
3.7 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Refer to Section 01650 "Commissioning of Systems - Demonstration and Instructions."

HARDWARE GROUPS

Hardware Set No. 1 – New SPED Classrooms

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Description</th>
<th>Model/Part Number</th>
<th>Manufacturer</th>
<th>Part Numbers</th>
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<td>T4A3786 NRP 4.5 x 4.5</td>
<td>US10 McKinney</td>
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<td>1</td>
<td>Mortise Lock</td>
<td>L9071 06N</td>
<td>612 Schlage</td>
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END OF SECTION 087100
SECTION 088000 - GLAZING

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 glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:

1. Doors.

B. Related Sections:

1. Section 081416 “Flush Wood Doors”.

1.3 DEFINITIONS

A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.

B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.

1.4 PERFORMANCE REQUIREMENTS

A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

1.5 ACTION SUBMITTALS

A. Product Data: For each glass product and glazing material indicated.

B. Glass Samples: For each type of glass product indicated; 12 inches square.

1. Clear monolithic vision glass.

C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For installers & manufacturers of insulating-glass units with low-e coatings.

B. Product Certificates: For glass and glazing products, from manufacturer.

C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for coated glass, insulating glass, glazing sealants, and glazing gaskets.

1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.

D. Preconstruction adhesion and compatibility test report.

E. Warranties: Sample of special warranties.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings: A qualified insulating-glass manufacturer who is approved by coated-glass manufacturer.

B. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.

C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.

D. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
E. Source Limitations for Glass: Obtain coated float glass, laminated glass and insulating glass from single source from single manufacturer for each glass type.

F. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

G. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.


H. Safety Glazing Labeling: Where safety glazing labeling is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

I. Pre-installation Conference: Conduct conference at project site.

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review temporary protection requirements for glazing during and after installation.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

B. Comply with insulating-glass manufacturer's written recommendations for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.9 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or below 40 deg F.

1.10 WARRANTY

A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer's standard form in which coated-glass manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.

1. Warranty Period: Five (5) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GLASS PRODUCTS, GENERAL

A. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.

1. Minimum Glass Thickness for Exterior Lites: Not less than 1/4-inch-thick.

B. Strength: Where float glass is indicated, provide annealed float glass, Kind HS heat-treated float glass, or Kind FT heat-treated float glass. Where heat-strengthened glass is indicated, provide Kind HS heat-treated float glass or Kind FT heat-treated float glass. Where fully tempered glass is indicated, provide Kind FT heat-treated float glass.

2.2 GLASS PRODUCTS

A. Heat-Treated, Fully Tempered Float Glass: ASTM C 1048; Type I; Quality-Q3; Class I (clear) unless otherwise indicated; of kind and condition indicated.

1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

2. For uncoated glass, comply with requirements for Condition A.

3. For coated vision glass, comply with requirements for Condition C.

2.3 GLAZING SEALANTS

A. General:
1. Compatibility: Provide glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.

3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, 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.

2.4 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; non-staining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:

1. AAMA 804.3 tape is for less-severe back-bedding and drop-in residential and light-commercial glazing applications. AAMA 806.3 tape is for high-performance commercial glazing applications involving continuous pressure from gaskets or pressure-generating stop designs. AAMA 807.3 tape is for commercial glazing applications not involving continuous pressure from gaskets and stop designs.

2. AAMA 804.3 tape, where indicated.

3. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.

4. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:

1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.

2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.
2.5 BY-PASS SLIDING DOOR TRACK SYSTEM

A. Product: KVM-P1092ANOC48 (basis-of-design)
   1. 1/4-inch thick glazing panels
   2. Mounting: Surface
   3. Finish: Anodized Aluminum

2.6 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.7 FABRICATION OF GLAZING UNITS

A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.

C. Grind smooth and polish exposed glass edges and corners.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Presence and functioning of weep systems.
3. Minimum required face and edge clearances.
4. Effective sealing between joints of glass-framing members.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that will leave visible marks in the completed work.

3.3 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Adjust glazing channel dimensions as required by Project conditions during installation to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

I. Set glass lites with proper orientation so that coatings face exterior, or interior as specified.

J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 CLEANING AND PROTECTION

A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer.

C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.

D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

END OF SECTION 088000
SECTION 092216 - NON-STRUCTURAL METAL FRAMING

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. Non-load-bearing steel framing systems for interior gypsum board assemblies.
2. Suspension systems for interior gypsum ceilings, soffits, and grid systems.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 INFORMATION SUBMITTALS

A. Evaluation Reports: For dimpled steel studs and runners, from ICC-ES.

PART 2 - PRODUCTS

2.1 DESCRIPTION

A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.
2.2 FRAMING SYSTEMS

A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
   1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
   2. Protective Coating: ASTM A 653/A 653M, G40 (interior applications) and ASTM A 653/A 653M, G60 (exterior applications), hot-dipped galvanized, unless otherwise indicated.

B. Studs and Runners: ASTM C 645. Use either steel studs and runners or dimpled steel studs and runners.
   1. Steel Studs and Runners:
      a. Minimum Base-Metal Thickness: 0.033 inch.
      b. Depth: See Drawings.
   2. Dimpled Steel Studs and Runners:
      a. Minimum Base-Metal Thickness: 0.025 inch.
      b. Depth: See Drawings.

C. Slip-Type Head Joints: At the top of all interior walls, provide one of the following:
   1. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
      a. Products: Subject to compliance with requirements, provide one of the following:
         1) Dietrich Metal Framing; SLP-TRK Slotted Deflection Track
         2) MBA Building Supplies; FlatSteel Deflection Track
         3) Steel Network Inc. (The); VertiTrack VTD Series
         4) Superior Metal Trim; Superior Flex Track System (SFT)
         5) Telling Industries; Vertical Slip Track

D. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
   1. Minimum Base-Metal Thickness: 0.033 inch.

E. Cold-Rolled Channel Bridging: Steel, 0.053-inch minimum base-metal thickness, with minimum 1/2-inch-wide flanges.
   1. Depth: 1-1/2 inches.
   2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.068-inch-thick, galvanized steel.

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F. Z-Shaped Furring: With slotted web, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, minimum uncoated-metal thickness of 0.018 inch, and depth indicated in drawings.

2.3 SUSPENSION SYSTEMS

A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch-diameter wire, or double strand of 0.048-inch-diameter wire.

B. Grid Suspension System for Gypsum Board Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.

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. Chicago Metallic Corporation; Drywall Grid System.
   c. USG Corporation; Drywall Suspension System.

2.4 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.

   1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

B. Isolation Strip at Exterior Walls: Provide one of the following:

   1. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.
   2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

2.5 GLASS-FIBER BLANKET INSULATION

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. CertainTeed Corporation.
   2. Johns Manville.
   3. Owens Corning.
B. Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

3.3 INSTALLATION, GENERAL

A. Installation Standard: ASTM C 754, except comply with framing sizes and spacing indicated.

1. Gypsum Plaster Assemblies: Also comply with requirements in ASTM C 841 that apply to framing installation.
2. Portland Cement Plaster Assemblies: Also comply with requirements in ASTM C 1063 that apply to framing installation.
3. Gypsum Veneer Plaster Assemblies: Also comply with requirements in ASTM C 844 that apply to framing installation.
4. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

C. Install bracing at terminations in assemblies.

D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.
3.4 INSTALLING FRAMED ASSEMBLIES

A. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

B. Install studs so flanges within framing system point in same direction.
   1. Space studs as follows:
      a. Single-Layer Application: 16 inches o.c. unless otherwise indicated.
      b. Multi-layer Application: 16 inches o.c. unless otherwise indicated.

C. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.
   1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
   2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
      a. Install two studs at each jamb unless otherwise indicated.
      b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
      c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
   3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
   4. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

D. Direct Furring:
   1. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.

E. Z-Furring Members:
   1. Z-furring members spaced 16 inches o.c.
   2. Securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.
F. Installation Tolerance: Install each framing member so fastening surfaces vary not
more than 1/8 inch from the plane formed by faces of adjacent framing.

END OF SECTION 092216
SECTION 092300 - GYPSUM PLASTERING

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. Gypsum plasterwork on GWB plaster base.

B. Related Sections:

1. Section 092216 "Non-Structural Metal Framing" for non-load-bearing steel framing and furring that support plaster base and gypsum plaster.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show locations and installation of control and expansion joints including plans, elevations, sections, details of components, and attachments to other work.

1.4 QUALITY ASSURANCE

A. Sound Transmission Characteristics: Where indicated, provide gypsum plaster assemblies identical to those of assemblies tested for STC ratings per ASTM E 90 and classified according to ASTM E 413 by a qualified testing agency.

B. Mockups: Before plastering, install mockups of at least 100 sq. ft. in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Install mockups for the following applications:

   a. Troweled Finishes: Surfaces indicated to receive nontextured paint finishes.
2. Simulate finished lighting conditions for review of mockups.
3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.

1.6 PROJECT CONDITIONS

A. Comply with ASTM C 842 requirements or gypsum plaster manufacturer's written recommendations, whichever are more stringent.

B. Room Temperatures: Maintain temperatures at not less than 55 deg F or greater than 80 deg F for at least seven days before application of gypsum plaster, continuously during application, and for seven days after plaster has set or until plaster has dried.

C. Avoid conditions that result in gypsum plaster drying out too quickly.

1. Distribute heat evenly; prevent concentrated or uneven heat on plaster.
2. Maintain relative humidity levels for prevailing ambient temperature that produce normal drying conditions.
3. Ventilate building spaces in a manner that prevents drafts of air from contacting surfaces during plaster application and until plaster is dry.

PART 2 - PRODUCTS

2.1 ACCESSORIES

A. General: Comply with ASTM C 841 and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.

B. Metal Accessories:

C. 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. Alabama Metal Industries Corporation; a Gibraltar Industries company.
2. CEMCO.
3. Clark Western Building Systems.
4. Dietrich Metal Framing; a Worthington Industries company.
5. MarinoWARE.
9. Cornerbeads: Fabricated from [zinc] [or] [zinc-coated (galvanized) steel].
   a. Small nose cornerbead with expanded flanges; use unless otherwise indicated.
   b. Small nose cornerbead with perforated flanges; use on curved corners.
   c. Small nose cornerbead with expanded flanges reinforced by perforated stiffening rib; use on columns and for finishing unit masonry corners.
   d. Bull nose cornerbead, radius minimum, with expanded flanges; use at locations indicated on Drawings.
10. Casing Beads: Fabricated from zinc-coated (galvanized) steel; square-edged style; with expanded flanges.
11. Control Joints: Fabricated from zinc-coated (galvanized) steel; one-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.
12. Expansion Joints: Fabricated from zinc-coated (galvanized) steel; folded pair of unperforated screeds in M-shaped configuration; with expanded flanges.
13. Two-Piece Expansion Joints: Fabricated from zinc-coated (galvanized) steel; formed to produce slip-joint and square-edged reveal that is adjustable from 1/4 to 5/8 inch wide; with perforated flanges.

D. Manufacturers: Subject to compliance with requirements, [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

   1. Fry Reglet Corporation.
   2. Gordon, Inc.
   3. MM Systems Corporation.
   4. Pittcon Industries.
   5. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221 (ASTM B 221M), Alloy 6063-T5.
   6. Finish: Chemical-conversion coating, ASTM D 1730, Type B, compatible with field-applied finish coatings specified

2.2 MISCELLANEOUS MATERIALS

A. Water for Mixing and Finishing Plaster: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.

B. Bonding Compound: ASTM C 631.

C. Steel Drill Screws: For metal-to-metal fastening, ASTM C 1002 or ASTM C 954, as required by thickness of metal being fastened; with pan head that is suitable for
application; in lengths required to achieve penetration through joined materials of no fewer than three exposed threads.

D. Fasteners for Attaching Metal Lath to Substrates: Complying with ASTM C 841.

E. Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, not less than 0.0475-inch diameter, unless otherwise indicated.

F. Acoustical Sealant: As specified in Section 079200 "Joint Sealants."

1. Sealants shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Sealants 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."

2.3 BASE-COAT PLASTER MATERIALS

A. Base-Coat Plasters, General: ASTM C 28/C 28M.


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. National Gypsum Company; Gold Bond Gypsolite.
   b. USG Corporation; Structo-Lite.

C. Aggregates for Base-Coat Plasters: ASTM C 35, sand.

2.4 FINISH-COAT PLASTER MATERIALS

A. Gypsum Ready-Mixed Finish Plaster: Manufacturer's standard, mill-mixed, gaged, interior finish.

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. National Gypsum Company; Gold Bond Uni-Kal.
   b. USG Corporation; Diamond Brand Interior Finish Plaster

B. Aggregates for Float Finishes: ASTM C 35, sand; graded per ASTM C 842.
2.5 PLASTER MIXES
A. Mixing: Comply with ASTM C 842 and manufacturer’s written instructions for applications indicated.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Examine nonstructural and structural metal framing, substrates, and hollow-metal frames, for compliance with requirements and other conditions affecting performance of the Work.
B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION
A. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.

3.3 INSTALLATION, GENERAL
1. Seal construction at perimeters, behind control and expansion joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations.
2. Comply with ASTM C 919 and manufacturer’s written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
B. Acoustical Sealant: Where required, seal joints between edges of plasterwork and abutting construction with acoustical sealant.

3.4 INSTALLING ACCESSORIES
A. General: Install according to ASTM C 841.
B. Cornerbeads: Install at external corners.
C. Casing Beads: Install at terminations of plasterwork, except where plaster passes behind and is concealed by other work and where metal screeds, bases, or frames act as casing beads.
D. Control Joints: Install control joints with spacing between joints in either direction not exceeding the following and in specific locations approved by Architect for visual effect:
1. Partitions: 30 feet.
2. Ceilings: 30 feet.

3.5 PLASTER APPLICATION

A. General: Comply with ASTM C 842.

1. Do not deviate more than plus or minus 1/8 inch in 10 feet from a true plane in finished plaster surfaces, as measured by a 10-foot (3-m) straightedge placed on surface.
2. Grout hollow-metal frames, bases, and similar work occurring in plastered areas, with base-coat plaster material, before lathing where necessary. Except where full grouting is indicated or required for fire-resistance rating, grout at least 6 inches at each jamb anchor.
3. Finish plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground unless otherwise indicated. Where casing bead does not terminate plaster at metal frame, cut base coat free from metal frame before plaster sets and groove finish coat at junctures with metal.
4. Provide plaster surfaces that are ready to receive field-applied finishes indicated.

B. Bonding Compound: Apply on unit masonry and concrete plaster bases.

C. Base Coats:

1. Base Coats over Expanded-Metal Lath: Gypsum neat plaster with job-mixed sand for scratch and brown coats.
2. Base Coats over Expanded-Metal Lath:
   a. Scratch Coat: Gypsum wood-fibered plaster; neat or with job-mixed sand.
3. Base Coats over Unit Masonry: Gypsum lightweight ready-mixed plaster.

D. Finish Coats:


E. Plaster Finishes:

1. Provide float finish unless otherwise indicated.

3.6 PLASTER REPAIRS

A. Repair or replace work to eliminate cracks, dents, blisters, buckles, crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.
3.7 CLEANING AND PROTECTION

A. Remove temporary protection and enclosure of other work. Promptly remove plaster from door frames, windows, and other surfaces not indicated to be plastered. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering.

END OF SECTION 092300
SECTION 092900 - GYPSUM BOARD

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. Interior gypsum board.

B. Related Requirements:
   1. Section 092216 "Non-Structural Metal Framing" for non-structural framing and suspension systems that support gypsum board panels.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For the following products:
   1. Trim Accessories: Full-size Sample in 12-inch-long length for each trim accessory indicated.

1.4 QUALITY ASSURANCE

A. Mockups: Before beginning gypsum board installation, install mockups of at least 100 sq. ft. in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Install mockups for the following:
      a. Each level of gypsum board finish indicated for use in exposed locations.
      b. Each texture finish indicated.

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2. Apply or install final decoration indicated, including painting on exposed surfaces for review of mockups.
3. Simulate finished lighting conditions for review of mockups.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer’s written recommendations, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

1. Indications that panels are wet, or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.2 INTERIOR GYPSUM BOARD

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. American Gypsum.
2. CertainTeed Corp.
3. Georgia-Pacific Gypsum LLC.
4. Lafarge North America Inc.
6. USG Corporation.

B. Gypsum Wallboard: ASTM C 1396/C 1396M.
   1. Thickness: 5/8 inch with, unless otherwise indicated on Drawings
   2. Long Edges: Tapered and featured (rounded or beveled) for prefilling.
   4. Indentation Resistance: ASTM C1629, Classification Level 1

A. Gypsum Board, Type ‘X’: ASTM C 1658/C 1658M.
   1. Core: 5/8-inch, Type X
   2. Long Edges: Tapered.

2.3 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.
   1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, or paper-faced galvanized steel sheet.
   2. Shapes:
      a. Cornerbead.
      b. LC-Bead: J-shaped; exposed long flange receives joint compound.
      c. L-Bead: L-shaped; exposed long flange receives joint compound.
      d. U-Bead: J-shaped; exposed short flange does not receive joint compound.
      e. Expansion (control) joint.

2.4 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:
   1. Interior Gypsum Board: Paper.

C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
   1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
   2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping or drying-type, all-purpose compound.

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a. Use setting-type compound for installing paper-faced metal trim accessories.

3. Fill Coat: For second coat, use setting-type, sandable topping compound.
4. Finish Coat: For third coat, use setting-type, sandable topping compound.
5. Skim Coat: For final coat of Level 5 finish, use high-build interior coating product designed for application by airless sprayer and to be used instead of skim coat to produce Level 5 finish.

2.5 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
   1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
   2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

D. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, for compliance with requirements and other conditions affecting performance.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840.
B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
   1. Fit gypsum panels around ducts, pipes, and conduits.
   2. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch-wide joints to install sealant.

G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch-wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

I. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 APPLYING INTERIOR GYPSUM BOARD

A. Single-Layer Application:
   1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
   2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing) unless otherwise indicated, and minimize end joints.
      a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
b. At stairwells and other high walls, install panels horizontally unless otherwise indicated.

3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

B. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.

3.4 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.

C. Interior Trim: Install in the following locations:
   1. Cornerbead: Use at outside corners unless otherwise indicated.
   2. LC-Bead: Use at exposed panel edges.
   3. L-Bead: Use where indicated.
   4. U-Bead: Use at exposed panel edges.
   5. Expansion (control) joint: Use where identified or recommended by manufacturer.

3.5 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints, rounded or beveled edges, and damaged surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
   1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
   2. Level 5: Typical at all exposed finished gypsum board wall and ceiling areas.
3.6 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
   1. Indications that panels are wet, or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
   2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900
SECTION 095123 - ACOUSTICAL TILE CEILINGS

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. Acoustical tiles for ceilings.
   2. Concealed suspension systems.

B. Related Requirements:
   1. None.

1.3 PREINSTALLATION MEETINGS

A. Pre-installation Conference: Conduct conference at project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture specified, 6-inches- in size.

C. Samples for Initial Selection: For components with factory-applied color finishes.

D. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.
   1. Acoustical Tile: Set of full-size Samples of each type, color, pattern, and texture.
1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Ceiling suspension-system members.
2. Size and location of initial access modules for acoustical tile.
3. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.

B. Qualification Data: For testing agency.

C. Product Test Reports: For each acoustical tile ceiling, for tests performed by a qualified testing agency.

D. Evaluation Reports: For each acoustical tile ceiling suspension system and anchor and fastener type, from ICC-ES.

E. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

Warranty: Submit manufacturer's warranty and ensure forms have been completed in Owner's name and registered with manufacturer. Minimum 10-year warranty with coverage against visible sag.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Acoustical Ceiling Units: Full-size tiles equal to Two (2) percent of quantity installed.
2. Suspension-System Components: Quantity of each concealed grid and exposed component equal to 2 percent of quantity installed.

1.8 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to the National Voluntary Laboratory Accreditation Program (NVLAP) for testing indicated.

B. 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 ceiling area 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.

1.9 DELIVERY, STORAGE, AND HANDLING
A. Deliver acoustical tiles, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
B. Before installing acoustical tiles, permit them to reach room temperature and a stabilized moisture content.
C. Handle acoustical tiles carefully to avoid chipping edges or damaging units in any way.

1.10 FIELD CONDITIONS
A. Environmental Limitations: Do not install acoustical tile ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical tile ceiling installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 25 (Comply with ASTM E 1264 for Class A materials).
2. Smoke-Developed Index: 50

2.2 ACOUSTICAL TILES, GENERAL
A. Source Limitations: Obtain each type of acoustical ceiling tile and supporting suspension system from single source from single manufacturer.
B. Acoustical Tile Standard: Provide manufacturer's standard tiles of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectance unless otherwise indicated.
1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches away from test surface according to ASTM E 795.

C. Acoustical Tile Colors and Patterns: Match appearance characteristics indicated for each product type.

1. Where appearance characteristics of acoustical tiles are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

2.3 ACOUSTICAL TILES (EXISTING TILE REMOVED AND REINSTALLED INTO EXISTING GRID, REPLACE IF DAMAGED)

A. Basis-of-Design Product: Subject to compliance with requirements, provide “22350 Radar, High NRC” Panels by USG or comparable product by one of the following:

1. Armstrong World Industries, Inc.

B. Color: Flat White

C. NRC: 0.70

D. Edge/Joint Detail:

1. Edge: SLT
2. Where tiles are field cut, provide edge/joint detail along all cut edges, match factory finished edges.

E. Thickness: 7/8-inch

F. Modular Size: 24 by 24 inches. See Drawings for exact sizes/layout.

1. These tiles are being installed into an existing metal suspension system (ceiling grid). The exact tiles size shall be field verified to fit into the existing suspension system prior to order and installation of the tile and new cross “T” grid secondary members.

G. Broad Spectrum Antimicrobial Fungicide and Bactericide Treatment: Provide acoustical panels treated with manufacturer's standard antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D 3273 and evaluated according to ASTM D 3274 or ASTM G 21.
2.4 METAL SUSPENSION SYSTEMS, GENERAL

A. Metal Suspension-System Standard: Provide manufacturer's standard metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635/C 635M.

B. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

1. Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to Five (5) times that imposed by ceiling construction, as determined by testing according to ASTM E 488 or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency.

   a. Type: Post-installed expansion or Post-installed bonded anchors.
   b. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (0.005 mm) for Class SC 1 service condition.
   c. Corrosion Protection: Stainless-steel components complying with ASTM F 593 and ASTM F 594, Group 1 Alloy 304 or 316 for bolts; Alloy 304 or 316 for anchors.

2. 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 hangers of type indicated, and with capability to sustain, without failure, a load equal to Ten (10) times that imposed by ceiling construction, as determined by testing according to ASTM E 1190, conducted by a qualified testing, and inspecting agency.

C. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:

2. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire.

D. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.

E. Angle Hangers: Angles with legs not less than 7/8 inch wide; formed with 0.04-inch-thick, galvanized-steel sheet complying with ASTM A 653/A 653M, G90 coating designation; with bolted connections and 5/16-inch-diameter bolts.
2.5 METAL SUSPENSION SYSTEM (GRID INSTALLED INTO EXISTING GRID)

A. Provide ceiling grid system that is compatible with the existing ceiling grid. 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. USG.
2. Armstrong World Industries, Inc.


C. Cross runners roll formed from and capped with cold-rolled steel sheet, pre-painted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, G30 coating designation shall be installed into the existing main runners.

1. Structural Classification: Match Existing Ceiling Grid.

D. Access: Match Existing Ceiling Grid.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing and substrates to which acoustical tile ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine acoustical tiles before installation. Reject acoustical tiles that are wet, moisture damaged, or mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Testing Substrates: Before installing adhesively applied tiles on wet-placed substrates such as cast-in-place concrete or plaster, test and verify that moisture level is below tile manufacturer’s recommended limits.

B. Measure each ceiling area and establish layout of acoustical tiles to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width tiles at borders and comply with layout shown on reflected ceiling plans.
3.3 INSTALLATION OF SUSPENDED ACOUSTICAL TILE CEILINGS

A. General: Install acoustical panel ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers’ plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, counter splaying, or other equally effective means.
3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, post-installed mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
8. Do not attach hangers to steel deck tabs.
9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
10. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
11. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or post-installed anchors.

D. Install edge moldings and trim of type indicated at perimeter of acoustical tile ceiling area and where necessary to conceal edges of acoustical tiles.
1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
3. Do not use exposed fasteners, including pop rivets, on moldings and trim.

E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

F. Arrange directionally patterned acoustical tiles as follows:
1. As indicated on reflected ceiling plans.

G. Install acoustical tiles in coordination with suspension system and exposed moldings and trim. Place splines or suspension-system flanges into kerfed edges so tile-to-tile joints are closed by double lap of material.
1. Fit adjoining tile to form flush, tight joints. Scribe and cut tile for accurate fit at borders and around penetrations through tile.
2. Hold tile field in compression by inserting leaf-type, spring-steel spacers between tile and moldings, spaced 12 inches o.c.

H. Protect lighting fixtures and air ducts to comply with requirements indicated for fire-resistance-rated assembly.

3.4 CLEANING

A. Clean exposed surfaces of acoustical tile ceilings, including trim and edge moldings. Comply with manufacturer’s written instructions for cleaning and touchup of minor finish damage. Remove and replace tiles and other ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095123
SECTION 096513 - RESILIENT BASE AND ACCESSORIES

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. Resilient base.

B. Related Sections:

1. None.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Initial Selection: For each type of product indicated.

C. Samples for Verification: For each type of product indicated, in manufacturer's standard-size Samples but not less than 12 inches long, of each resilient product color, texture, and pattern required.

D. Product Schedule: For resilient products use same designations indicated on Drawings.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.
1.5 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
   1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

B. Mockups: Provide resilient products with mockups specified in other Sections.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.7 PROJECT CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 85 deg F, in spaces to receive resilient products during the following time periods:
   1. 48 hours before installation.
   2. During installation.
   3. 48 hours after installation.

B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 85 deg F.

C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 RESILIENT BASE (VB-1)

A. Resilient Base:

   1. **Basis-of-Design Product:** Subject to compliance with requirements, provide Traditional 4" Base by Johnsonite or comparable product by one of the following:
      a. Armstrong
      b. Johnsonite
      c. Roppe.

1. Material Requirement: Type TV (vinyl, vulcanized thermoplastic)
2. Manufacturing Method: Group I (solid, homogeneous)

C. Style: Cove (base with toe)

D. Minimum Thickness: 0.125 inch

E. Height: 4-inch

F. Lengths: Coils in manufacturer's standard length.

G. Outside Corners: Premolded internal or job formed.

H. Inside Corners: Premolded external or job formed.

I. Color: #48 “Grey”.

2.2 RESILIENT BASE (VB-2 & VB-3)

A. Resilient Base:
   1. **Basis-of-Design Product:** Subject to compliance with requirements, provide Traditional 6” (VB-2) or 4” (VB-3) Base by Johnsonite or comparable product by one of the following:
      a. Armstrong
      b. Johnsonite
      c. Roppe.

   1. Material Requirement: Type TV (vinyl, vulcanized thermoplastic)
   2. Manufacturing Method: Group I (solid, homogeneous)

C. Style: Cove (base with toe)

D. Minimum Thickness: 0.125 inch (3.2 mm)

E. Height: 4-inch & 6-inch.

F. Lengths: Coils in manufacturer's standard length.

G. Outside Corners: Premolded internal or job formed.

H. Inside Corners: Premolded external or job formed.

I. Color: #40 “Black”
2.3 RESILIENT MOLDING ACCESSORY

A. Resilient Molding Accessory:
   
   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. Johnsonite.
      b. Roppe Corporation, USA.

B. Description: Reducer strip for resilient floor covering and Transition strips. See details.

C. Material: Vinyl.

D. Profile and Dimensions:

   1. Vinyl transition Carpet-to-VCT (VN-1): Roppe #177
   2. Vinyl reducer strip Carpet-to-Concrete/Terrazzo (VN-2): Roppe #174

E. Colors and Patterns: Colors to match vinyl base, see finish schedule for locations.

2.4 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

C. Proceed with installation only after unsatisfactory conditions have been corrected.
3.2 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

C. Do not install resilient products until they are same temperature as the space where they are to be installed.
   1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

D. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 RESILIENT BASE INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient base.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

G. Preformed Corners: Install preformed corners before installing straight pieces.

H. Job-Formed Corners:
   1. Outside Corners: Use straight pieces of maximum lengths possible. Form without producing discoloration (whitening) at bends.
   2. Inside Corners: Use straight pieces of maximum lengths possible.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.
B. Perform the following operations immediately after completing resilient product installation:

1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover resilient products until Substantial Completion.

END OF SECTION 096513
SECTION 096519 - RESILIENT TILE FLOORING

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. Vinyl composition tile (VCT).

B. Related Sections:

1. Section 096513 "Resilient Base and Accessories" for resilient base, reducer strips, and other accessories installed with resilient floor coverings.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For each type of floor tile. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.

1. Show details of special patterns.

C. Samples for Initial Selection: For each type of floor tile indicated.

D. Product Schedule: For floor tile. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.
1.5 CLOSEOUT SUBMITTALS
   A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.6 MATERIALS MAINTENANCE SUBMITTALS
   A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
      1. Floor Tile: Furnish 1 box for every Fifty (50) boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

1.7 QUALITY ASSURANCE
   A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation indicated.
      1. Engage an installer who employs workers for this Project who are trained or certified by manufacturer for installation techniques required.
   B. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
      1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.
   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 for floor tile including resilient base and accessories.
         a. Size: Minimum 100 sq. ft. for each type, color, and pattern in locations directed by Architect.

1.8 DELIVERY, STORAGE, AND HANDLING
   A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 85 deg F. Store floor tiles on flat surfaces.

1.9 PROJECT CONDITIONS
   A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 85 deg F, in spaces to receive floor tile during the following time periods:

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1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 85 deg F.

C. Close spaces to traffic during floor tile installation.

D. Close spaces to traffic for 48 hours after floor tile installation.

E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 VINYL COMPOSITE TILE (VCT):

A. Basis of Design Product: Subject to compliance with requirements, provide Standard Excelon Imperial Texture w/ Diamon 10 Technology Coating VCT tile by Armstrong or comparable prior approved product by one of the following:

2. Mannington Mills, Inc.
3. Tarkett.

B. Tile Standard: ASTM F 1066, Class 2, through pattern tile.
C. Static Load Limit: ASTM F 970, 2000 psi
D. Wearing Surface: Smooth w/ diamond infused coating.
E. Thickness: 0.125 inch.
F. Size and Pattern: 12x12, Quarter Turn
G. Color: Antique White (#51811).

2.2 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by manufacturer to suit floor tile and substrate conditions indicated.

C. Floor Polish: Provide protective liquid floor polish products as recommended by manufacturer.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F 710.
   1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
   2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
   3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
   4. Moisture Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install floor tiles until they are same temperature as space where they are to be installed.
   1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

F. Remove and replace additional existing damaged / discolored field tile- approximately 25 SF per science room. Note that additional 25 SF quantity is in addition to locations identified in documents. Coordinate with Owner & Architect on which field tile should be replaced.
3.3 FLOOR TILE INSTALLATION

A. Comply with manufacturer's written instructions for installing floor tile.

B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.

1. Lay tiles in pattern to match existing installation.

C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.

1. Lay tiles in pattern to match existing installation.

D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings unless noted otherwise.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent, non-staining marking device.

G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.

H. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protection of floor tile.

B. Perform the following operations immediately after completing floor tile installation:

1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

C. Protect floor tile products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
D. Floor Polish: Remove soil, visible adhesive, and surface blemishes from floor tile surfaces before applying liquid floor polish.

1. Apply One (1) coat Ecolab Rivet Sealer
2. Apply Four (4) coats Wax – Gemstar Gemini
3. Burnish Floor

E. Cover floor tile until Substantial Completion.

END OF SECTION 096519
SECTION 096813 – TILE CARPETING

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 modular, tufted carpet tile.

B. Related Requirements:

1. Section 024119 "Selective Demolition" for removing existing floor coverings.
2. Section 096513 "Resilient Base and Accessories" for resilient base, reducer strips, and other accessories installed with tile carpet floor coverings.

1.3 PRE-INSTALLATION MEETINGS

A. Pre installation Conference: Conduct conference at Project site.

1. Review methods and procedures related to carpet tile installation including, but not limited to, the following:
   a. Review delivery, storage, and handling procedures.
   b. Review ambient conditions and ventilation procedures.
   c. Review subfloor preparation procedures.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include manufacturer’s written data on physical characteristics, durability, and fade resistance.
2. Include installation recommendations for each type of substrate.

B. Shop Drawings: Show the following:

1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
2. Carpet tile type, color, and dye lot.
3. Type of subfloor.
4. Type of installation.
5. Pattern of installation.
6. Pattern type, location, and direction.
7. Pile direction.
8. Type, color, and location of insets and borders.
9. Type, color, and location of edge, transition, and other accessory strips.
10. Transition details to other flooring materials.

C. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.

2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch-long Samples.

D. Product Schedule: For carpet tile. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For carpet tile, for tests performed by a qualified testing agency.

B. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:

1. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
2. Precautions for cleaning materials and methods that could be detrimental to carpet tile.

1.7 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. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd.
1.8 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who is certified by the International Certified Floorcovering Installers Association at the Commercial II certification level.

B. Fire-Test-Response Ratings: Where indicated, provide carpet tile identical to those of assemblies tested for fire response according to NFPA 253 by a qualified testing agency.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Comply with CRI 104.

1.10 FIELD CONDITIONS

A. Comply with CRI 104 for temperature, humidity, and ventilation limitations.

B. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weather tight, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at occupancy levels during the remainder of the construction period.

C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.

D. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

1.11 WARRANTY

A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.

1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.

2. Failures include, but are not limited to, more than 10 percent edge raveling, snags, runs, dimensional stability, excess static discharge, loss of tuft bind strength, loss of face fiber, and delamination.

3. Warranty Period: Lifetime. 10-year on static, 10-year on Color.
PART 2 - PRODUCTS

2.1 CARPET FIELD TILE (CPT1)
   A. Products: Subject to compliance with requirements, provide the following:
      1. “Relay” from the Exchange 2 Collection as manufactured by Mannington Commercial.
   B. Color: Solution Dyed - #12143 “Haptics”
   C. Pattern: Monolithic
   D. Fiber Type: Type 6,6 Nylon, 21 oz.
   E. Size: 24 by 24 inches

2.2 INSTALLATION ACCESSORIES
   A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
   B. Adhesives: Water-resistant, mildew-resistant, non-staining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.
   A. Metal Edge/Transition Strips: Extruded aluminum with mill or anodized finish of profile and width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.

PART 3 - EXECUTION

3.1 EXAMINATION
   A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance. Examine carpet tile for type, color, pattern, and potential defects.
   B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
      1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and
dryness characteristics by performing bond and moisture tests recommended by
carpet tile manufacturer.
2. Subfloor finishes comply with requirements specified in Section 033000 "Cast-in-
Place Concrete" for slabs receiving carpet tile.
3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.

C. For wood subfloors, verify the following:
1. Underlayment over subfloor complies with requirements specified in
   Section 061000 "Rough Carpentry."
2. Underlayment surface is free of irregularities and substances that may interfere
   with adhesive bond or show through surface.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION
A. General: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation," and
   with carpet tile manufacturer's written installation instructions for preparing substrates
   indicated to receive carpet tile installation.
B. Use trowelable leveling and patching compounds, according to manufacturer's written
   instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level
   cracks, holes, and depressions 1/8 inch wide or wider and protrusions more than 1/32
   inch unless more stringent requirements are required by manufacturer's written
   instructions.
C. Remove coatings, including curing compounds, and other substances that are
   incompatible with adhesives and that contain soap, wax, oil, or silicone, without using
   solvents. Use mechanical methods recommended in writing by carpet tile
   manufacturer.
D. Clean metal substrates of grease, oil, soil, and rust, and prime if directed by adhesive
   manufacturer. Rough sand painted metal surfaces and remove loose paint. Sand
   aluminum surfaces, to remove metal oxides, immediately before applying adhesive.
E. Broom and vacuum clean substrates to be covered immediately before installing carpet
   tile.

3.3 INSTALLATION
A. General: Comply with CRI 104, Section 14, "Carpet Modules," and with carpet tile
   manufacturer's written installation instructions.
B. Installation Method: Glue down; install every tile with full-spread, releasable, pressure-
sensitive adhesive.
C. Maintain dye lot integrity. Do not mix dye lots in same area.
D. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.

E. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, non-staining marking device.

G. Install pattern parallel to walls and borders.

H. Stagger joints of carpet tiles so carpet tile grid is offset from access flooring panel grid. Do not fill seams of access flooring panels with carpet adhesive; keep seams free of adhesive.

3.4 CLEANING AND PROTECTION

A. Perform the following operations immediately after installing carpet tile:

1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet tile manufacturer.
2. Remove yarns that protrude from carpet tile surface.

B. Protect installed carpet tile to comply with CRI 104, Section 16, "Protecting Indoor Installations."

C. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION 096813
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.
7. Plaster.
8. ASJ insulation covering.

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.

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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.

B. Products: Subject to compliance with requirements, provide product listed in other Part 2 articles for the paint category indicated.

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 BLOCK FILLERS

A. Block Filler, Latex, Interior: MPI #4.

2.4 PRIMERS/SEALERS

A. Primer relative to substrate type and as recommended by manufacturer.

2.5 DRY FOG/FALL COATINGS

A. Dry Fall, Latex, Flat: MPI #118.

2.6 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. Existing Walls & Ceilings: Remove loose paint or plaster, patch & blend with existing adjacent textures. Sand out voids or ridges in existing finish to produce a smooth, uniform surface.

J. Aluminum Substrates: Remove loose surface oxidation.

K. 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."

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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. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

1. Paint the following work where exposed to view:
   a. Uninsulated & Insulated metal piping.
   b. Uninsulated & Insulated plastic piping.
   c. Pipe hangers and supports.
   d. Metal or Plastic conduit.
   e. Fire suppression/sprinkler piping
   f. Tanks that do not have factory-applied final finishes.
   g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering, paint-grade galvanization or other paintable jacket material.
   h. Other items as directed by Architect.
   i. Portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are exposed to view.

2. DO NOT Paint the following work where exposed to view:
   a. DO NOT PAINT SPRINKLER HEADS.
   b. 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.
   c. DO NOT PAINT SURFACE MOUNT PANDUIT RACEWAY OR DEVICE BOXES - The Panduit LDPH10 surface mount raceway and the data termination boxes shall not be painted.
   d. CLEANING NOT ACCEPTABLE - Cleaning of painted cable is not acceptable.
e. 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. CMU Substrates:
   1. Latex System:
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C. Steel Substrates:
   1. Alkyd System:

D. Galvanized-Metal Substrates:
   1. Latex over Waterborne Primer System:

E. 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):

F. ASJ Insulation-Covering Substrates: Including pipe and duct coverings.
   1. Latex System:
      c. Topcoat: Latex, interior, flat, (Gloss Level 2).

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
SECTION 099300 - STAINING AND TRANSPARENT FINISHING

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 surface preparation and application of existing wood finishes.

1. Interior Substrates:
   a. Existing and new wood trim.
   b. Existing wood wainscot and wall paneling.
   c. Existing wood scientific casework.

1.3 DEFINITIONS

A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

C. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

D. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

E. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include preparation requirements and application instructions.

B. Samples for Initial Selection: For each type of product indicated.
C. Samples for Verification: For each type of finish system and in each color and gloss of finish indicated.

1. Submit Samples on representative samples of actual wood substrates, 8 inches (200 mm) square.
2. Label each Sample for location and application area.

D. Product List: For each product indicated, include the following:

1. Cross-reference to finish system and locations of application areas. Use same designations indicated on Drawings and in schedules.
2. Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the product proposed for use highlighted.
3. VOC content.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Stains and Transparent Finishes: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

1.6 QUALITY ASSURANCE

A. Mockups: Apply mockups of each finish system indicated and each color 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 type of finish system and substrate.
   a. Architect will designate items or areas required.
2. Final approval of stain color selections will be based on mockups.
   a. If preliminary stain color selections are not approved, apply additional mockups of additional stain colors selected by Architect at no added cost to Owner.

1.7 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 (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

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1.8 FIELD CONDITIONS

A. Apply finishes only when temperature of surfaces to be finished and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply finishes when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

C. Do not apply exterior finishes in snow, rain, fog, or mist.

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:

2. Benjamin Moore & Co.
4. Euclid Chemical Company.
5. ICI Paints.
6. PPG Architectural Finishes, Inc.
7. Sherwin-Williams Company (The).
8. Zinsser.

B. Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to products listed in other Part 2 articles for the category indicated.

2.2 MATERIALS, GENERAL

A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."

B. Material Compatibility:

1. Provide materials for use within each finish 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 finish system, provide products recommended in writing by manufacturers of topcoat for use in finish system and on substrate indicated.

C. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction and, for interior stains and finishes applied at project site, the following VOC limits,
exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

1. Clear Wood Finishes, Varnishes: VOC not more than 350 g/L.
2. Shellacs, Clear: VOC not more than 730 g/L.
3. Stains: VOC not more than 250 g/L.
4. Primers, Sealers, and Undercoaters: 200 g/L.

D. Stain Colors: To match existing conditions.

2.3 WOOD FILLERS

A. Wood Filler Paste: MPI #91.

2.4 STAINS

A. Stain, Semi-Transparent, for Interior Wood: Verify with existing adjacent per location. Multiple stains may be required.

2.5 POLYURETHANE VARNISHES

A. Varnish, Interior, Polyurethane, Oil-Modified, Gloss (Gloss Level 6. Verify with existing adjacent): MPI #56.

2.6 SOURCE QUALITY CONTROL

A. Testing of Materials: Owner reserves the right to invoke the following procedure:

1. Owner will engage the services of a qualified testing agency to sample wood finishing materials. Contractor will be notified in advance and may be present when samples are taken. If 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 wood finishes if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying materials from Project site, pay for testing, and refinish surfaces finished with rejected materials. Contractor will be required to remove rejected materials from previously finished surfaces before refinish with complying materials if the two finishes are incompatible or produce results that, in the opinion of the Architect, are aesthetically unacceptable.
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 Interior Wood Substrates: 10 percent, when measured with an electronic moisture meter.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Proceed with finish application only after unsatisfactory conditions have been corrected.

1. Beginning finish application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and finishing.

1. After completing finishing operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean and prepare surfaces to be finished according to manufacturer's written instructions for each particular substrate condition and as specified.

1. Remove dust, dirt, oil, and grease by washing with a detergent solution; rinse thoroughly with clean water and allow to dry. Remove grade stamps and pencil marks by sanding lightly. Remove loose wood fibers by brushing.

2. Remove mildew by scrubbing with a commercial wash formulated for mildew removal and as recommended by stain manufacturer.

D. Interior Wood Substrates:

1. Scrape and clean knots and apply coat of knot sealer before applying primer.

2. Apply wood filler paste to open-grain woods, as defined in "MPI Architectural Painting Specification Manual," to produce smooth, glasslike finish.

3. Sand surfaces that will be exposed to view and dust off.
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 finishes according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."

1. Use applicators and techniques suited for finish and substrate indicated.
2. Finish surfaces behind movable equipment and furniture same as similar exposed surfaces.
3. Do not apply finishes over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

B. Apply finishes to produce surface films without cloudiness, holidays, lap marks, brush marks, runs, ropiness, or other surface imperfections.

3.4 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing finish application, clean spattered surfaces. Remove spattered materials by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from finish application. Correct damage 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 finished wood surfaces.

3.5 INTERIOR WOOD-Finish-System SCHEDULE

A. Existing wood cabinets and trim.

1. Polyurethane Varnish over Stain System:
   a. Stain Coat: Stain, semi-transparent, for interior wood, MPI #90.
   d. Topcoat: Varnish, interior, polyurethane, oil-modified, gloss (Gloss Level 6) MPI #56.
SECTION 101100 - VISUAL DISPLAY SURFACES

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. Markerboards.
   2. Support systems for visual display boards.

1.3 DEFINITIONS

A. Visual Display Board Assembly: Visual display surface that is factory fabricated into composite panel form, either with or without a perimeter frame; includes chalkboards, markerboards, and tack boards.

B. Visual Display Surface: Surfaces that are used to convey information visually, including surfaces of chalkboards, markerboards, tack boards, and surfacing materials that are not fabricated into composite panel form but are applied directly to walls.

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 visual display surfaces.
   1. Include individual panel weights for sliding visual display units.

B. Shop Drawings: For visual display surfaces. Include plans, elevations, sections, details, and attachments to other work.
   1. Show locations of panel joints.
   2. Show locations of special-purpose graphics for visual display surfaces.
   3. Include sections of typical trim members.
C. Samples for Initial Selection: For each type of visual display surface indicated, for units with factory-applied color finishes, and as follows:
   1. Actual sections of tack board assembly and visual display wall panel.
   3. Include accessory Samples to verify color selected.

D. Samples for Verification: For each type of visual display surface indicated.
   1. Visual Display Surface: Not less than 8-1/2 by 11 inches mounted on substrate indicated for final Work. Include one panel for each type, color, and texture required.
   2. Trim: 6-inch-long sections of each trim profile.
   4. Accessories: Full-size Sample of each type of accessory.

E. Product Schedule: For visual display surfaces. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for surface-burning characteristics of fabrics.

C. Warranties: Sample of special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For visual display surfaces to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of motor-operated, sliding visual display units required for this Project.

B. Source Limitations: Obtain visual display surfaces from single source from single manufacturer.

C. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

   1. Flame-Spread Index: 25
2. Smoke-Developed Index: 50

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver factory-built visual display surfaces, including factory-applied trim where indicated, completely assembled in one piece without joints, where possible. If dimensions exceed maximum manufactured panel size, provide two or more pieces of equal length as acceptable to Architect. When overall dimensions require delivery in separate units, pre-fit components at the factory, disassemble for delivery, and make final joints at the site.

B. Store visual display surfaces vertically with packing materials between each unit.

1.9 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install visual display surfaces until spaces are enclosed and weather tight, wet work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

B. Field Measurements: Verify actual dimensions of construction contiguous with visual display surfaces by field measurements before fabrication.

1. Allow for trimming and fitting where taking field measurements before fabrication might delay the Work.

1.10 WARRANTY

A. Special Warranty for Porcelain-Enamel Face Sheets: Manufacturer's standard form in which manufacturer agrees to repair or replace porcelain-enamel face sheets that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

   a. Surfaces lose original writing and erasing qualities.
   b. Surfaces exhibit crazing, cracking, or flaking.

2. Warranty Period: Fifty (50) years from date of Substantial Completion.
PART 2 - PRODUCTS

2.1  MARKERBOARD ASSEMBLIES

A. Porcelain-Enamel Markerboards: Balanced, high-pressure, factory-laminated markerboard assembly of three-ply construction consisting of backing sheet, core material, and 0.021-inch-thick, porcelain-enamel face sheet with low-gloss or matte finish.

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. AARCO Products, Inc.
   b. Best-Rite Manufacturing.
   c. Claridge Products and Equipment, Inc.
   d. American Specialties, Inc.


3. Laminating Adhesive: Manufacturer's standard, moisture-resistant thermoplastic type.

2.2  MARKERBOARD ACCESSORIES

A. Aluminum Frames and Trim: Fabricated from not less than 0.062-inch-thick, extruded aluminum; standard size and shape.


B. Chalk Tray: Manufacturer's standard, continuous.

C. Map Rail: Provide the following accessories:

   1. Display Rail: Continuous and integral with map rail; fabricated from cork approximately 1 to 2 inches wide.
   2. End Stops: Located at each end of map rail.
   3. Map Hooks: (2) map hooks for every 48 inches of map rail or fraction thereof.
   4. Flag Holder: One for each room.

2.3  FABRICATION

A. Factory-Assembled Visual Display Units: Coordinate factory-assembled units with trim and accessories indicated. Join parts with a neat, precision fit.
1. Make joints only where total length exceeds maximum manufactured length. Fabricate with minimum number of joints, as indicated on approved Shop Drawings.
2. Provide manufacturer's standard vertical-joint spline system between abutting sections of marker boards.
3. Where size of visual display boards or other conditions require support in addition to normal trim, provide structural supports or modify trim as indicated or as selected by Architect from manufacturer's standard structural support accessories to suit conditions indicated.

B. Aluminum Frames and Trim: Fabricate units straight and of single lengths, keeping joints to a minimum. Miter corners to a neat, hairline closure.

1. Where factory-applied trim is indicated, trim shall be assembled and attached to visual display units at manufacturer's factory before shipment.

2.4 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.5 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, surface conditions of wall, and other conditions affecting performance of the Work.

B. Examine roughing-in for electrical power systems to verify actual locations of connections before installation of motor-operated, sliding visual display units.

C. Examine walls and partitions for proper preparation and backing for visual display surfaces.
D. Examine walls and partitions for suitable framing depth where sliding visual display units will be installed.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Comply with manufacturer's written instructions for surface preparation.

B. Clean substrates of substances that could impair the performance of and affect the smooth, finished surfaces of visual display boards, including dirt, mold, and mildew.

3.3 INSTALLATION, GENERAL

A. General: Install visual display surfaces in locations and at mounting heights indicated on Drawings, or if not indicated, at heights indicated below. Keep perimeter lines straight, level, and plumb. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.

3.4 INSTALLATION OF FACTORY-FABRICATED VISUAL DISPLAY BOARDS AND ASSEMBLIES

A. Visual Display Boards: Attach concealed clips, hangers, and grounds to wall surfaces and to visual display boards with fasteners at not more than 16 inches o.c. Secure both top and bottom of boards to walls.

3.5 INSTALLATION OF RAIL SUPPORT SYSTEM

A. Rail Support System: Install horizontal support rail in locations and at mounting heights indicated on Drawings, or if not indicated, at height indicated below. Attach to wall surface with fasteners at 12 inches o.c.

1. Hang visual display units on rail support system.

3.6 CLEANING AND PROTECTION

A. Clean visual display surfaces according to manufacturer's written instructions. Attach one cleaning label to visual display surface in each room.

B. Touch up factory-applied finishes to restore damaged or soiled areas.

C. Cover and protect visual display surfaces after installation and cleaning.
SECTION 101416 - PLAQUES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. This project will 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 plaques.

B. Related Requirements:

1. Section 220553 "Identification for Plumbing Piping and Equipment" for labels, tags, and nameplates for plumbing systems and equipment.
2. Section 230553 "Identification for HVAC Piping and Equipment" for labels, tags, and nameplates for HVAC systems and equipment.
3. Section 260553 "Identification for Electrical Systems" for labels, tags, and nameplates for electrical equipment.

1.3 DEFINITIONS

A. Accessible: In accordance with the accessibility standard.

1.4 ACTION SUBMITTALS

A. Plaque Schedule: Use same designations specified or indicated on Drawings or in a plaque or sign schedule. Working with the Architect and owner, prepare and submit a schedule indicating the following:

1. Room Name and Room Number to be shown on each plaque.
2. Location of each plaque, by room number, as indicated on the Drawings.
3. Mounting heights and exact mounting locations by each door (taking into account the required clearances).

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For plaques to include in maintenance manuals.

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PART 2 - PRODUCTS

2.1 PLAQUES, GENERAL

A. Plastic engraved room name and number signage to be provided by Owner and installed by Contractor.

B. Contractor shall assume approximately one name/number sign per room door.

2.2 PERFORMANCE REQUIREMENTS

A. Accessibility Standard: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 for signs.

2.3 ACCESSORIES

A. Two-Face Tape: Manufacturer's standard high-bond, foam-core, vinyl tape, 0.045 inch thick, with adhesive on both sides provided by Contractor.

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 plaque work.

B. Verify that plaque-support surfaces are within tolerances to accommodate plaques without gaps or irregularities between backs of plaques and support surfaces unless otherwise indicated.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install plaques using mounting methods indicated and according to manufacturer's written instructions.

1. Install plaques level, plumb, true to line, and at locations and heights indicated, with plaque surfaces free of distortion and other defects in appearance.

2. Install plaques so they do not protrude or obstruct according to the accessibility standard.
3. Before installation, verify that plaque surfaces are clean and free of materials or debris that would impair installation.

4. Two-Face Tape: Clean bond-breaking materials from substrate surface and remove loose debris. Apply tape strips symmetrically to back of plaque and of suitable quantity to support weight of plaque without slippage. Keep strips away from edges to prevent visibility at plaque edges. Place plaque in position and push to engage tape adhesive.

3.3 ADJUSTING AND CLEANING

A. Remove and replace damaged or deformed plaques and plaques that do not comply with specified requirements. Replace plaques with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

B. Remove temporary protective coverings and strippable films as plaques are installed.

C. On completion of installation, clean exposed surfaces of plaques according to manufacturer's written instructions and touch up minor nicks and abrasions in finish. Maintain plaques in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 101416
SECTION 102800 - TOILET ACCESSORIES

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. Public-use accessories.
   2. Underlavatory guards.

B. Related Sections:
   1. None

1.3 ACTION SUBMITTALS

1. None

B. Product Schedule: See Drawings for locations of owner provided, contractor installed accessories.

1.4 INFORMATIONAL SUBMITTALS

A. Warranty: Sample of special warranty.

1.5 QUALITY ASSURANCE

A. Source Limitations: Products provided by owner. Coordinate delivery with Owners’ representative.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
1.6  COORDINATION

A. Coordinate delivery of accessories with owners' representative during pre-construction meeting.

B. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

C. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.7  WARRANTY

1. Contractor shall warrant installation for duration of builder's warranty.

PART 2 - PRODUCTS

2.1  PUBLIC-USE ACCESSORIES

A. Paper Towel (Roll) Dispensers:
   1. Furnished by owner, installed by contractor.

B. Liquid-Soap Dispensers:
   1. Furnished by owner, installed by contractor.

C. Liquid-Sanitizer Dispensers:
   1. Furnished by owner, installed by contractor.

2.2  UNDERLAVATORY GUARDS

A. Provide one at each sink, typ.

B. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

C. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

   1. Plumberex Specialty Products, Inc.
   2. Truebro by IPS Corporation.

D. Description: Insulating pipe covering for supply and drain piping assemblies that prevent direct contact with and burns from piping; allow service access without removing coverings.
E. Material and Finish: Antimicrobial, molded plastic, white.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install unit’s level, plumb, and firmly anchored in locations and at heights indicated.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Devices damaged while in possession of contractor for installation shall be replaced in-kind by contractor.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer’s written recommendations.

END OF SECTION 102800
SECTION 122113 - HORIZONTAL LOUVER BLINDS

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. Horizontal louver blinds with aluminum slats.

B. Related Requirements:

   1. Section 061000 "Rough Carpentry" for wood blocking and grounds for mounting horizontal louver blinds and accessories.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Show fabrication and installation details for horizontal louver blinds.

   1. Motorized Operators: Include details of installation in headrails and diagrams for power, signal, and control wiring.

C. Samples: For each exposed product and for each color and texture specified, 12 inches long.

D. Samples for Verification: For each type and color of horizontal louver blind indicated.

   1. Slat: Not less than 12 inches long.
   2. Tapes: Full width, not less than 6 inches long.
   3. Horizontal Louver Blind: Full-size unit, not less than 16 inches wide by 24 inches long.
   4. Valance: Full-size unit, not less than 12 inches wide.
1.4 INFORMATIONAL SUBMITTALS
   A. Product Certificates: For each type of horizontal louver blind.

1.5 CLOSEOUT SUBMITTALS
   A. Maintenance Data: For horizontal louver blinds to include in maintenance manuals.

1.6 DELIVERY, STORAGE, AND HANDLING
   A. Deliver horizontal louver blinds in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

1.7 FIELD CONDITIONS
   A. Environmental Limitations: Do not install horizontal louver blinds until construction and wet and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
   B. Field Measurements: Where horizontal louver blinds are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
   A. Source Limitations: Obtain horizontal louver blinds from single source from single manufacturer.

2.2 HORIZONTAL LOUVER BLINDS, ALUMINUM SLATS
   A. Basis-of-Design Product: Subject to compliance with requirements, provide Levelor “Riviera Dust Guard” or comparable product by one of the following:
   B. Slats: Aluminum; alloy and temper recommended by producer for type of use and finish indicated; with crowned profile and radius corners.
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1. Width: 2 inches
2. Thickness: Manufacturer's standard.
3. Spacing: Manufacturer's standard.
5. Features:
   a. Lift-Cord Rout Holes: Minimum size required for lift cord and located near back (outside) edge of slat to maximize slat overlap and minimize light gaps between slats.

C. Headrail: Formed steel or extruded aluminum; long edges returned or rolled. Headrails fully enclose operating mechanisms on three sides.
   1. Capacity: One blind per headrail unless otherwise indicated.
   2. Ends: Capped or plugged.
   3. Manual Lift Mechanism:
      a. Lift-Cord Lock: Variable; stops lift cord at user-selected position within blind full operating range
      b. Operator: Extension of lift cord(s) through lift-cord lock mechanism to form cord pull.
      a. Tilt: Full.
      c. Over-Rotation Protection: Manufacturer's detachable operator or slip clutch to prevent over rotation of gear.
   5. Manual Lift-Operator and Tilt-Operator Lengths: Full length of blind when blind is fully closed
   7. Integrated Headrail/Valance: Manufacturer’s standard.

D. Bottom Rail: Formed-steel or extruded-aluminum tube that secures and protects ends of ladders and lift cords and has plastic- or metal-capped ends.
   1. Type: Manufacturer's standard

E. Lift Cords: Manufacturer's standard braided cord.

F. Ladders: Evenly spaced across headrail at spacing that prevents long-term slat sag.
   1. Type: Reinforced vinyl tape, manufacturer's standard width or Cloth tape, manufacturer's standard width.

G. Valance: Manufacturer's standard.
H. Mounting Brackets: With spacers and shims required for blind placement and alignment indicated.
   1. Type: Provide brackets as required for installation shown on drawings.
   2. Intermediate Support: Provide intermediate support brackets to produce support spacing recommended by blind manufacturer for weight and size of blind.

I. Hold-Down Brackets and Hooks or Pins: Manufacturer's standard.

J. Side Channels and Perimeter Light Gap Seals: Manufacturer's standard.

K. Colors, Textures, Patterns, and Gloss:
   1. Slats: As selected by Architect from manufacturer's full range.
   2. Components: Provide rails, cords, ladders, and materials exposed to view matching or coordinating with slat color unless otherwise indicated.

2.3 HORIZONTAL LOUVER BLIND FABRICATION

A. Product Safety Standard: Fabricate horizontal louver blinds to comply with WCMA A 100.1 including requirements for corded, flexible, looped devices; lead content of components; and warning labels.

B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F:
   1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which blind is installed less 1/4 inch per side or 1/2-inch total, plus or minus 1/8 inch. Length equal to head-to-sill dimension of opening in which blind is installed less 1/4 inch, plus or minus 1/8 inch.
   2. Outside of Jamb Installation: Width and length as indicated, with terminations between blinds of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.

C. Concealed Components: Non-corrodible or corrosion-resistant-coated materials.

D. Mounting and Intermediate Brackets: Designed for removal and reinstallation of blind without damaging blind and adjacent surfaces, for supporting blind components, and for bracket positions and blind placement indicated.

E. Installation Fasteners: No fewer than two fasteners per bracket, fabricated from metal noncorrosive to brackets and adjoining construction; type designed for securing to supporting substrate; and supporting blinds and accessories under conditions of normal use.
F. Color-Coated Finish:
   1. Metal: For components exposed to view, apply manufacturer's standard baked finish complying with manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance.

   1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install horizontal louver blinds level and plumb, aligned and centered on openings, and aligned with adjacent units according to manufacturer's written instructions.

   1. Locate so exterior slat edges are not closer than 1 inch from interior faces of glass and not closer than 1/2 inch from interior faces of glazing frames through full operating ranges of blinds.
   2. Install mounting and intermediate brackets to prevent deflection of headrails.
   3. Install with clearances that prevent interference with adjacent blinds, adjacent construction, and operating hardware of glazed openings, other window treatments, and similar building components and furnishings.

3.3 ADJUSTING

A. Adjust horizontal louver blinds to operate free of binding or malfunction through full operating ranges.

3.4 CLEANING AND PROTECTION

A. Clean horizontal louver blind surfaces after installation according to manufacturer's written instructions.

B. Provide final protection and maintain conditions in a manner acceptable to manufacturer and Installer and that ensures that horizontal louver blinds are without damage or deterioration at time of Substantial Completion.

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C. Replace damaged horizontal louver blinds that cannot be repaired in a manner approved by Architect before time of Substantial Completion.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain systems.

END OF SECTION 122113
SECTION 125653 – LABORATORY CASEWORK AND EQUIPMENT

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. Plastic-laminate-faced laboratory casework.
2. Phenolic Resin Countertops & Splashes
3. Laboratory Plumbing Fixtures & Fittings
4. Laboratory Equipment & Accessories

B. Related Requirements:

1. Section 061000 “Rough Carpentry” for wood furring, blocking, shims, and hanging strips required for installing cabinets and concealed within other construction before cabinet installation.
2. Section 224000 “Plumbing Fixtures” and Plumbing drawings for other plumbing fixtures, piping, and accessories not included in this section.
3. Section 262726 “Wiring Devices” and Electrical drawings for other electrical fixtures, pathways, and devices not included in this section.

1.3 PREINSTALLATION MEETINGS

A. Division 1 – General Requirements: Pre-installation meeting.

B. Convene minimum one-week prior to commencing Work of this Section.

1.4 ACTION SUBMITTALS

A. Division 1 – General Requirements: Submittal procedures.

B. Product Data:
1. Submit data on high-pressure plastic laminate, pressure fused laminate, phenolic resin countertops & splashes, and edging.
2. Submit data on hardware, sinks, sink fittings, service fixtures, safety equipment and accessories.

C. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, cross sections, rough in and anchor placement dimensions and tolerances, attachment devices, and other components.

D. Samples for Initial Selection:
   1. Plastic laminates for cabinet exteriors & interiors.
   2. PVC edge banding.
   3. Thermoset decorative panels.
   4. Phenolic resin countertop & splash finishes.
   5. Submit one sample of pulls, hinges, and locks illustrating hardware finish and style.

1.5 CLOSEOUT SUBMITTALS

A. Division 1 – General Requirements: Closeout submittals

B. Product Record Documents: Record actual locations of concealed utility connections. Record actual locations of installed locks and their master key codes.

C. Operation data: Submit description of equipment operation, adjusting, and testing required. Identify system maintenance requirements, servicing cycles, lubrication types required, and spare parts sources.

D. Keys: Deliver with identifying tabs to Owner.

E. Warranty: Submit manufacturers warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.6 QUALITY ASSURANCE

A. Comply with the “Architectural Woodwork Standards” for grades of architectural plastic-laminate cabinets indicated for construction, finishes, installation, and other requirements.
   1. Provide labels and certificates from AWI certification program indicating that woodwork, including installation, complies with requirements of grades specified.
   2. The contract documents contain selection 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.

B. Grade: Premium
C. Installer Qualifications/Requirements: Fabricator of products

D. Single Source Manufacturer: Casework, countertops and laboratory casework products must all be engineered and built by a single source manufacturer in order to ensure consistency and quality for these related products. Splitting casework, countertops and/or architectural millwork between multiple manufacturers will not be permitted.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Section 1 – General Requirements: product storage and handling requirements.

B. Do not deliver cabinets until painting and similar operations that could damage woodwork have been completed in installation areas. If cabinets must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

C. Accept casework on site. Inspect on arrival for damage.

D. Coordinate size of access and route to place of installation.

1.8 FIELD CONDITIONS

A. Division 1 – General Requirements: Environmental conditions affecting products on site.

B. Environmental Limitations: Do not deliver or install cabinets 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 25 and 55 percent during the remainder of the construction period.

C. Field Measurements: Where cabinets are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed, and indicate measurements on Shop Drawings.

D. Established Dimensions: Where cabinets are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.9 COORDINATION

A. Division 1 – General Requirements: Coordination and Project conditions.
B. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that cabinets can be supported and installed as indicated.

C. Coordinate Work with location and placement of utilities. Coordinate characteristics of utilities with requirements of laboratory casework.

D. Sequence installation to accommodate utility connections.

E. Hardware Coordination: Distribute copies of approved hardware schedule specified in Section 087111 "Door Hardware (Descriptive Specification)" to fabricator of architectural woodwork; coordinate Shop Drawings and fabrication with hardware requirements.

1.10 EXISTING CONDITIONS

A. Field Measurements: Verify field measurements prior to fabrication. Indicate field measurements on Shop Drawings.

1.11 WARRANTY

A. Division 1 – General Requirements: Closeout submittals.

B. Provide 3-year manufacturer warranty for laboratory casework.

C. Provide manufacturer’s standard warranties for sinks, sink fittings, and service fixtures.

PART 2 - PRODUCTS

2.1 PLASTIC-LAMINATE-CLAD LABORATORY CASEWORK

A. Manufactured Plastic Laminate Casework: Manufacturers – Subject to compliance with requirements, provide the following or prior approved equal:

1. TMI Systems Corporation; K-12 Education Casework Line.
2. Substitutions: Section 01630 – Product Options and Substitutions

B. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicated, as required by woodwork quality standard.

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. Nevamar
b. Formica Corporation
2. Basis of design selections:
   a. Exposed surfaces include but are not limited to cabinet finished ends, fronts, modesty panels, and finished backs. As manufactured by Wilsonart: English Oak #7885.
   b. Semi-Exposed Interior Surfaces: As manufactured by Wilsonart: English Oak #7885.
   c. Drawers: To coordinate with Semi-Exposed interior surface per location.
   d. Cabinet backs: To coordinate with Semi exposed interior surface per location.
   e. Cabinet Interiors: White.

C. Laminate for Exposed and Semi-exposed surfaces:
   1. Horizontal Surfaces: Grade HGS (.048") NEMA Test LD 3-2005
   2. Post-formed Surfaces: Grade HGP (.039") NEMA Test LD 3-2005
   3. Vertical Surfaces: Grade VGS (.028") NEMA Test LD 3-2005
   4. Cabinet liner: Grade CLS (.020") NEMA Test LD 3-2005
   5. High Pressure Backer BKH (.039") NEMA Test LD 3-2005
   6. Thermally fused melamine TFM laminate NEMA Test LD 3-2005. TFM allowed on casework interiors only. TFM on exterior casework surfaces, including door and drawer faces and finished ends, will not be permitted.

D. Edges:
   a. 1mm PVC edge banding, machine applied. Matching laminate in color, pattern, and finish.
   b. 3mm PVC edge banding, machine applied. Matching laminate in color, pattern, and finish.

E. Door and drawer fronts: Shall be 3/4-inch-thick particleboard and shall have VGS laminate balanced with high-pressure cabinet liner CLS. Edges shall have 3mm PVC with 1/8” radius edge extrusions matching face.

F. Wall cabinets: Tops and bottoms are glued and doweled to cabinet sides and internal cabinet components such as fixed horizontals, rails and verticals. Minimum 6 dowels each joint for 24” deep cabinets and a minimum of 4 dowels each joint for 12” deep cabinets. (mechanical or metal hardware fasteners joining cabinet top and bottom panels to the sides will not be accepted.) Tops, bottoms and sides of all cabinets are particleboard core.

G. Wall cabinet bottoms shall have laminate matching exterior.

H. Mounting frames: Incorporated into wall and tall units shall be 3/4-inch-thick with minimum 2 dowel pins per mounting frame and end joint. Base units shall have 8-1/2” wide mounting frames with minimum 3 dowel pins per mounting frame end joint.
I. Tall cabinets shall be 3/4-inch-thick members throughout, and tops and bottoms shall include back groove and minimum 8 total dowels per end joint.

J. Base cabinets except sink base units: full sub-top glued and doweled to cabinet sides. (Mechanical or metal hardware fasteners joining cabinet sub-top panel to the sides will not be accepted.)
   1. Sink base units are provided with open top and a stretcher at the front, attached to the sides. Back to be split removable access panel.
   2. Accessible sink base cabinets: provide removable access panel to conceal undercounter piping.
   3. Demonstration mobile/ADA lab stations: provide left hinged door, adjustable shelf, 3 equal drawers, black epoxy top, 2 fixed rubber wheeled casters, and 2 swivel rubber wheeled casters with brakes.

K. Side panels and vertical dividers shall receive adjustable shelf hardware at 32mm line boring centers. Mount door hinges, drawer slides and pull-out shelved in the line boring for consistent alignment.

L. Toe kicks: Bases and tall cabinets shall be integral base design. Construction of end panels, cabinet bottoms and horizontal toe kick members shall be integrally joined together for greater structural strength.

M. Cabinet backs: 1/4-inch-thick medium density fiberboard panel fully captured by the cabinet top, bottom and side panels. Finish to match cabinet interior. 3/4-inch x 4” particleboard rails will be placed behind the back panel at the top and bottom and doweled to the sides utilizing 10mm hardwood fluted dowels. A third intermediate rail will be included on all cabinets taller than 56”. Utilize hot melt glue to further secure back and increase overall strength.
   1. Exposed back on fixed or movable cabinets: 3/4-inch-thick particleboard with the exterior surface finished in VGS laminate as selected.

N. Dust Panels: 1/4-inch-thick plywood or tempered hardboard above compartments and drawers unless located directly under tops.

O. Drawer Construction: Fabricate with exposed fronts fastened to sub-front with mounting screws from interior of body.
   1. Sides, back and sub-front: Solid-hardwood lumber.
   2. Drawer bottom: hardwood plywood
   3. Join sub-fronts, backs, and sides with glued rabbeted joints supplemented by mechanical fasteners or glued dovetail joints.

2.2 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.

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1. Wood Moisture Content: 5 to 10 percent.

B. Composite Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.

1. Medium-Density Fiberboard: ANSI A208.2, Grade 130
2. Particleboard: ANSI A208.1, Grade M-2
3. 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.

2.3 COUNTERTOPS

A. Solid Phenolic Compact (SPC)

1. Countertops: 1-inch-thick solid phenolic compact countertops. Tops shall be factory fabricated and drilled, with exposed cutouts and edges dressed with factory finish. Leading edges shall have 1/4-inch radius and include bottom drip grooving. Tops shall be installed with compatible sealant per manufacturers recommendations. Sink openings shall include a perimeter cutout for seamless bonding of drop-in sink.
2. Backsplash & Side Splash: 4” or 6” as indicated.
3. Provide fillers between transitions between countertop heights.
4. Color: black

2.4 CABINET HARDWARE AND ACCESSORIES

A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets except for items specified in Section 087111 “Door Hardware”.

B. Hinges: Heavy-duty, 5-knuckle, 270-degree pivot with 2-3/4” reveal overlay style hinges. Hinges shall have interlaying leaves 270-degree swing construction of 0.090” thickness steel. Hinges shall be Grade 1 with hospital ground tips and non-removeable pin. Doors 48” or less shall have 2 hinges per door. Door exceeding 48” shall have 3 hinges per door. Hinges shall have vertical adjustment and shall be mounted with 2-5mm thread-in screw bolts plus 2 additional #8 screws in cabinet leaf. Door leaf shall have 2-5 mm thread-in bolts plus 3-#8 screws. Hinges to have powder coated finish.

Note: In 3250 & 3270 match existing hinge style/finish.

C. Door catches: Magnetic door catch with 5-pound pull provided, attached with screws, and slotted for adjustment. Full height tall cabinet doors shall have catches at both top and bottom.

D. Wire Pulls: 4” U-shaped, easy grip profile. 8mm diameter. One each door and drawer. Finish: Epoxy powder coated black.
Note: In 3250 & 3270 match existing pull style/finish.

E. Drawer Slides: BHMA A156.9.
   1. Full extension, 150-pound load rated epoxy coated steel, bottom corner mounted with smooth and quiet nylon rollers. Positive stop both directions with self-closing feature.

F. Shelf Supports: adjustable shelf supports shall incorporate integral molded lock tabs to retain shelf from tipping or inadvertent lift out. Supports shall have 5mm diameter double pin engagement into precision bored cabinet vertical hole patterns. Adjustment shall be 1-1/4” spacing. Supports shall have compression ridge effecting force against shelf edge to maintain positive pin engagement. Supports shall have molded-in screw attachment feature. Static test load shall exceed 200# per clip.

G. Locks (Doors and Drawers): High security 6-tumbler lock system shall be provided on drawer and door openings where indicated on Drawings. Locks shall have diecast body with dead bolt engagement tang, cylinder locks with attached rotating cams not acceptable. Locks shall have removable and interchangeable 6-tumbler core for easy field and Owner re-keying options. Locks shall be keyed to casework master key as well as individual keying for each room. Provide owner with (5) master keys.

H. Permanent Drawer & Door Label Holders: Provide permanent label holders for all new and existing drawer & door faces. Basis-of-design: Hafele #168.00.713.

2.5 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: kiln dried to less than 15 percent moisture content.

B. 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.

C. Adhesives: Do not use adhesives that contain urea formaldehyde.

D. Adhesive for Bonding Plastic Laminate: Contact cement.

2.6 FABRICATION

A. Fabricate cabinets to dimensions, profiles, and details indicated.

B. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as
necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements before disassembling for shipment.

C. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

2.7 FIXTURES

* Note: items not included in this section are to be provided by mechanical and/or electrical contractors. *

A. **EK1**: Electrical Keystone Outlet: Basis of design: [WaterSaver E400WS](#).
   1. Receptacles. E433GF-WSL.
   2. Device finish: Black
   3. See electrical for further information and requirements.

B. **ES1**: Emergency Shower & Eye Wash Station: Basis of design: [WaterSaver SSBF909](#). See plans and elevations for mounting type location.
   1. Thermostatic mixing valves (TMV); required by ASNI Z358.1-2014. Provided by Mechanical Contractor.
   2. Provide SST cover for eye/face wash bowl (BC).

C. **GBV1**: Laboratory gas ball valve, double 90°, deck mounted. Basis of design: [WaterSaver L4200-132AWSA](#).

D. **GBV2**: Laboratory gas ball valve, double straight (180°), deck mounted. Basis of design: [WaterSaver L4200-132SWSA](#).

E. **LS1**: Liquid Soap Dispenser
   1. Owner-furnished, contractor-installed. See section 102800 Toilet Accessories.

F. **MF1**: Mixing Faucet – Wrist Blade
   1. Basis of design: [WaterSaver L414-VB-BH](#).

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2. Deck mounted for hot and cold water. Rigid/swing gooseneck. Integral vacuum breaker. 1/2-inch IPS with two 1/2-inch OC slip joints. 3/8-inch NPS female outlet with removable aerator. Locations as indicated on Drawings. Verify gooseneck length with sink mounting. Provide 6” or 9” as required.

G. MF2: Mixing Faucet – Four Arm Handle
   1. Basis of design: WaterSaver L414-VB.

2. Deck mounted for hot and cold water. Rigid/swing gooseneck. Integral vacuum breaker. 1/2-inch IPS with two 1/2-inch OC slip joints. 3/8-inch NPS female outlet with removable aerator. Locations as indicated on Drawings. Verify gooseneck length with sink mounting. Provide 6” or 9” as required.

H. PT1: Paper Towel Dispenser
   1. Owner-furnished, contractor-installed. See section 102800 Toilet Accessories.

I. HS1: Hand Sanitizer Dispenser
   1. Owner-furnished, contractor-installed. See section 102800 Toilet Accessories.

J. SS1: Scientific Sink – Accessible
   1. Basis of Design: Durcon #A05 (AESL05C) molded epoxy drop-in sink. 14”x10”x5”
   2. Molded in one solid piece, coved inside corners, dished bottom to outlet, and color matched to tops. See Drawings.

PART 3 - EXECUTION

3.1 PREPARATION

A. Division 1- General Requirements: Coordination and project conditions

B. Before installation, condition cabinets to average prevailing humidity conditions in installation areas.

C. Before installing cabinets, examine shop-fabricated work for completion and complete work as required.

3.2 INSTALLATION

A. Grade: Install cabinets to comply with same grade as item to be installed.

B. Assemble cabinets and complete fabrication at Project site to the extent that it was not completed in the shop.
C. Install cabinets 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 cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

E. Anchor cabinets 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. Use filler matching finish of items being installed.

F. Cabinets: Install without distortion so doors and drawers’ fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
   1. Install cabinets with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
   2. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches o.c. with No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.

3.3 ADJUSTING AND CLEANING

A. Division 1 - General Requirements: Testing, adjusting, and balancing.

B. Division 1 - General Requirements: Final Cleaning.

C. Division 1 - General Requirements: Protecting installed work.

D. Repair damaged and defective cabinets, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

E. Clean, lubricate, and adjust hardware.

F. Clean cabinets on exposed and semi-exposed surfaces.

3.4 SCHEDULE

A. Plastic-Laminate-Clad Laboratory Casework:
   1. Refer to Drawings for casework locations and model numbers.
   2. Color selections and applications:
a. Exposed: cabinet finish edges, fronts, modesty panels, and finish back HPL shall be selected from Wilsonart Design Group 1 patterns; 3 colors for each school building, as selected.

b. Interior and Semi-Exposed surfaces: Selected from manufacturer’s standard; 2 color for each school building, as selected from Pearl (solid) color or Maple (Woodgrain pattern)

c. Drawers: Selected from manufacturer’s standard; 1 color for each school building, as selected from Pearl (solid) color or Maple (woodgrain pattern).

d. Backs: Selected from manufacturer’s standard; 1 color for each school building, as selected from Pearl (solid) color or Maple (woodgrain pattern).

e. Edging: Selected from manufacturers standard; 3 colors for each school building, as selected.

END OF SECTION 125653
PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Above ground piping.
   B. Escutcheons.
   C. Mechanical couplings.
   D. Pipe hangers and supports.

1.02 RELATED REQUIREMENTS
   A. Section 211300 - Fire-Suppression Sprinkler Systems: Sprinkler systems design.

1.03 REFERENCE STANDARDS
   H. AWWA C606 - Grooved and Shouldered Joints 2015.

1.04 SUBMITTALS
   A. See Section 013000 - Administrative Requirements for submittal procedures.
   B. Product Data: Provide manufacturer's catalog information. Indicate valve data and ratings.
   C. Shop Drawings: Indicate pipe materials used, jointing methods, supports, and floor and wall penetration seals. Indicate installation, layout, weights, mounting and support details, and piping connections.
   D. Project Record Documents: Record actual locations of components and tag numbering.
   E. Operation and Maintenance Data: Include installation instructions and spare parts lists.

1.05 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
   B. Installer Qualifications: Company specializing in performing work of the type specified in this section.
      1. Minimum three years experience.
      2. Approved by manufacturer.
   C. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.
1.06 DELIVERY, STORAGE, AND HANDLING
   A. Deliver and store valves in shipping containers, with labeling in place.
   B. Provide temporary protective coating on cast iron and steel valves.
   C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

PART 2 PRODUCTS
2.01 GENERAL REQUIREMENTS
   A. Sprinkler-based System:
      2. See Section 211300.
   B. Welding Materials and Procedures: Comply with ASME BPVC-IX.
   C. Provide system pipes, fittings, sleeves, escutcheons, seals, and other related accessories.

2.02 ABOVE GROUND PIPING
   A. Steel Pipe: ASTM A795 Schedule 40, black.
      2. Mechanical Grooved Couplings: Malleable iron housing clamps to engage and lock, "C" shaped elastomeric sealing gasket, steel bolts, nuts, and washers; galvanized for galvanized pipe.

2.03 ESCUTCHEONS
   A. Material:
      1. Grade TP304, seamless tube, ASTM A269/A269M stainless steel.
   B. Construction:
      1. One-piece for mounting on chrome-plated pipe and one-piece type elsewhere.
      2. Internal spring tension devices or setscrews to maintain a fixed position against a surface.

2.04 PIPE HANGERS AND SUPPORTS
   A. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.
   B. Hangers for Pipe Sizes 2 inches and Over: Carbon steel, adjustable, clevis.

2.05 MECHANICAL COUPLINGS
   A. Manufacturers:
      5. Substitutions: See Section 016000 - Product Requirements.
   B. Rigid Mechanical Couplings for Grooved Joints:
      3. Housing Material: Fabricate of ductile iron complying with ASTM A536.
      5. Gasket Material: EPDM suitable for operating temperature range from minus 30 degrees F to 230 degrees F.
PART 3 EXECUTION

3.01 PREPARATION
A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
B. Remove scale and foreign material, from inside and outside, before assembly.
C. Prepare piping connections to equipment with flanges or unions.

3.02 INSTALLATION
A. Install sprinkler system and service main piping, hangers, and supports in accordance with NFPA 13.
B. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.
C. Install piping to conserve building space, to not interfere with use of space and other work.
D. Group piping whenever practical at common elevations.
E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
F. Pipe Hangers and Supports:
   1. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
   2. Place hangers within 12 inches of each horizontal elbow.
   3. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
   5. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
G. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.
H. Prepare pipe, fittings, supports, and accessories for finish painting. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc-rich primer to welding.
I. Provide sleeves when penetrating floors, walls, and partitions. Seal pipe including sleeve penetrations to achieve fire resistance equivalent to fire separation required.
J. Escutcheons:
   1. Install and firmly attach escutcheons at piping penetrations into finished spaces.
   2. Provide escutcheons on both sides of partitions separating finished areas through which piping passes.
   3. Use chrome plated escutcheons in occupied spaces and to conceal openings in construction.
K. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, unions, and couplings for servicing are consistently provided.

3.03 CLEANING
A. Upon completion of work, clean all parts of the installation.
B. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.

END OF SECTION
SECTION 210553
IDENTIFICATION FOR FIRE SUPPRESSION PIPING AND EQUIPMENT

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Nameplates.
   B. Tags.
   C. Pipe markers.
   D. Ceiling tacks.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide manufacturers catalog literature for each product required.
   C. Manufacturer's Installation Instructions: Indicate special procedures, and installation instructions.

PART 2 PRODUCTS
2.01 IDENTIFICATION APPLICATIONS
   A. Piping: Pipe markers.
   B. Valves: Nameplates and ceiling tacks where above lay-in ceilings.

2.02 NAMEPLATES
   A. Manufacturers:
   B. Description: Laminated three-layer plastic with engraved letters.
      2. Letter Height: 1/4 inch.

2.03 TAGS
   A. Manufacturers:
   B. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.
   C. Valve Tag Chart: Typewritten letter size list in anodized aluminum frame.

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2.04 PIPE MARKERS
   A. Manufacturers:
   B. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.
   C. Color code as follows:
      1. Fire Quenching Fluids: Red with white letters.

2.05 CEILING TACKS
   A. Manufacturers:
      2. Substitutions: See Section 016000 - Product Requirements.
   B. Description: Steel with 3/4 inch diameter color coded head.

PART 3 EXECUTION

3.01 PREPARATION
   A. Degrease and clean surfaces to receive adhesive for identification materials.

3.02 INSTALLATION
   A. Install nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
   B. Install tags with corrosion resistant chain.
   C. Install plastic pipe markers in accordance with manufacturer's instructions.
   D. Use tags on piping 3/4 inch diameter and smaller.
      1. Identify service, flow direction, and pressure.
      2. Install in clear view and align with axis of piping.
      3. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.
   E. Locate ceiling tacks to locate valves above T-bar type panel ceilings. Locate in corner of panel closest to equipment.

END OF SECTION
SECTION 211300
FIRE-SUPPRESSION SPRINKLER SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Wet-pipe sprinkler system.
B. System design, installation, and certification.

1.02 REFERENCE STANDARDS

1.03 ADMINISTRATIVE REQUIREMENTS
A. Preinstallation Meeting: Convene one week before starting work of this section.

1.04 SUBMITTALS
A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on sprinklers, valves, and specialties, including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.
C. Shop Drawings:
   1. Indicate hydraulic calculations, detailed pipe layout, hangers and supports, sprinklers, components and accessories. Indicate system controls.
D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. Extra Sprinklers: Type and size matching those installed, in quantity required by referenced NFPA design and installation standard.
   3. Sprinkler Wrenches: For each sprinkler type.
E. Project Record Documents: Record actual locations of sprinklers and deviations of piping from drawings. Indicate drain and test locations.

1.05 QUALITY ASSURANCE
A. Comply with FM (AG) requirements.
B. Designer Qualifications: Design system under direct supervision of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.
C. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
D. Installer Qualifications: Company specializing in performing the work of this section with minimum three years experience and approved by manufacturer.
E. Equipment and Components: Provide products that bear FM (AG) label or marking.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Store products in shipping containers and maintain in place until installation. Provide temporary inlet and outlet caps. Maintain caps in place until installation.
PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Sprinklers, Valves, and Equipment:

2.02 SPRINKLER SYSTEM

A. Sprinkler System: Provide coverage for building areas noted.
B. Occupancy: Light hazard; comply with NFPA 13.
C. Water Supply: Determine volume and pressure from water flow test data.
D. Storage Cabinet for Spare Sprinklers and Tools: Steel, located adjacent to alarm valve.

2.03 SPRINKLERS

A. Suspended Ceiling Type: Recessed pendant type with matching push on escutcheon plate.
   1. Response Type: Quick.
   2. Coverage Type: Standard.
   3. Finish: Enamel, color as selected.
   4. Fusible Link: Glass bulb type temperature rated for specific area hazard.
B. Flexible Drop System: Stainless steel, multiple use, open gate type.
   1. Application: Use to properly locate sprinkler heads.
   2. Include all supports and bracing.
   3. Provide braided type tube as required for the application.
   4. Manufacturers:

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with referenced NFPA design and installation standard.
B. Install equipment in accordance with manufacturer’s instructions.
C. Place pipe runs to minimize obstruction to other work.
D. Place piping in concealed spaces above finished ceilings.
E. Center sprinklers in two directions in ceiling tile and provide piping offsets as required.
F. Apply masking tape or paper cover to ensure concealed sprinklers, cover plates, and sprinkler escutcheons do not receive field paint finish. Remove after painting. Replace painted sprinklers.
G. Flush entire piping system of foreign matter.
H. Hydrostatically test entire system.
I. Require test be witnessed by Fire Marshal.

END OF SECTION
SECTION 220553
IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Tags.
   B. Pipe markers.
   C. Ceiling tacks.

1.02 REFERENCE STANDARDS

PART 2 PRODUCTS

2.01 IDENTIFICATION APPLICATIONS
   A. Piping: Pipe markers.
   B. Valves: Tags.

2.02 TAGS
   A. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.

2.03 PIPE MARKERS
   A. Comply with ASME A13.1.
   B. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.
   C. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.
   D. Color code as follows:
      1. Potable, Cooling, Boiler, Feed, Other Water: Green with white letters.
      2. Natural Gas: Yellow with black letters.

2.04 CEILING TACKS
   A. Description: Steel with 3/4 inch diameter color coded head.
   B. Color code as follows:
      1. Plumbing Valves: Green.

PART 3 EXECUTION

3.01 PREPARATION
   A. Degrease and clean surfaces to receive adhesive for identification materials.

3.02 INSTALLATION
   A. Install tags with corrosion resistant chain.
   B. Use tags on piping 3/4 inch diameter and smaller.
      1. Identify service, flow direction, and pressure.
      2. Install in clear view and align with axis of piping.
      3. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.
   C. Locate ceiling tacks to locate valves or dampers above lay-in panel ceilings. Locate in corner of panel closest to equipment.

END OF SECTION
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PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Piping insulation.
   B. Jackets and accessories.

1.02 RELATED REQUIREMENTS
   A. Section 078400 - Firestopping.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

1.05 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years of documented experience.
   B. Applicator Qualifications: Company specializing in performing the type of work specified in this section and approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING
   A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS
   A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

2.02 GLASS FIBER
   A. Manufacturers:
      1. CertainTeed Corporation: www.certainteed.com
      2. Johns Manville Corporation: www.jm.com
      4. Owens Corning Corporation: www.ocbuildingspec.com
      5. Substitutions: See Section 016000 - Product Requirements.
B. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible.
   1. K Value: ASTM C177, 0.24 at 75 degrees F.
   2. Maximum Service Temperature: 850 degrees F.
   3. Maximum Moisture Absorption: 0.2 percent by volume.
C. Vapor Barrier Jacket: White Kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E96/E96M of 0.02 perm-inches.
D. Tie Wire: 0.048 inch stainless steel with twisted ends on maximum 12 inch centers.
E. Vapor Barrier Lap Adhesive: Compatible with insulation.

2.03 JACKETS
A. PVC Plastic.
   1. Jacket: One piece molded type fitting covers and sheet material, off-white color.
      a. Minimum Service Temperature: 0 degrees F.
      b. Maximum Service Temperature: 150 degrees F.
      c. Moisture Vapor Permeability: 0.002 perm inch, maximum, when tested in accordance with ASTM E96/E96M.
      d. Thickness: 10 mil.
      e. Connections: Brush on welding adhesive.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that piping has been tested before applying insulation materials.
B. Verify that surfaces are clean and dry, with foreign material removed.

3.02 INSTALLATION
A. Install in accordance with manufacturer's instructions.
B. Install in accordance with North American Insulation Manufacturers Association (NAIMA) National Insulation Standards.
C. Exposed Piping: Locate insulation and cover seams in least visible locations.
D. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, and expansion joints.
E. Glass fiber insulated pipes conveying fluids below ambient temperature:
   1. Provide vapor barrier jackets, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples and vapor barrier mastic.
   2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor barrier adhesive or PVC fitting covers.
F. For hot piping conveying fluids 140 degrees F or less, do not insulate flanges and unions at equipment, but bevel and seal ends of insulation.
G. Glass fiber insulated pipes conveying fluids above ambient temperature:
   1. Provide standard jackets, with or without vapor barrier, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples.
   2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.
H. Inserts and Shields:
1. Application: Piping 1-1/2 inches diameter or larger.
2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
3. Insert Location: Between support shield and piping and under the finish jacket.
4. Insert Configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.

I. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions. At fire separations, refer to Section 078400.

J. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces (less than 10 feet above finished floor): Finish with PVC jacket and fitting covers.

3.03 SCHEDULES

A. Plumbing Systems:
1. Domestic Cold Water Supply:
   a. Glass Fiber Insulation:
      1) Thickness: 1 inch.
2. Domestic Hot Water Supply:
   a. Glass Fiber Insulation:
      1) Thickness: 1 inch.
3. Sanitary Waste/Vent (Exposed):
   a. Glass Fiber Insulation:
      1) Thickness: 1 inch.

END OF SECTION
PART 1  GENERAL

1.01  SECTION INCLUDES
   A. Pipe, pipe fittings, specialties, and connections for piping systems.
      1. Sanitary sewer.
      2. Domestic water.
      3. Flanges, unions, and couplings.
      4. Pipe hangers and supports.
      5. Ball valves.

1.02  RELATED REQUIREMENTS
   A. Section 220719 - Plumbing Piping Insulation.

1.03  REFERENCE STANDARDS
   B. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings 2018.
   O. AWWA C651 - Disinfecting Water Mains 2014.
   S. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends 2010.
1.04 SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide data on pipe materials, pipe fittings, valves, and
      accessories. Provide manufacturers catalog information. Indicate valve data and ratings.
   C. Project Record Documents: Provide electronic copy of completed As-Built drawings within
      30 days of substantial completion.

1.05 QUALITY ASSURANCE
   A. Perform work in accordance with applicable codes.
   B. Identify pipe with marking including size, ASTM material classification, ASTM specification,
      water pressure rating.

1.06 DELIVERY, STORAGE, AND HANDLING
   A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
   B. Provide temporary end caps and closures on piping and fittings. Maintain in place until
      installation.
   C. Protect piping systems from entry of foreign materials by temporary covers, completing
      sections of the work, and isolating parts of completed system.

1.07 FIELD CONDITIONS
   A. Do not install underground piping when bedding is wet or frozen.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS
   A. Potable Water Supply Systems: Provide piping, pipe fittings, and solder and flux (if used),
      that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.

2.02 SANITARY SEWER PIPING, ABOVE GRADE
   A. Cast Iron Pipe: ASTM A74, service weight.
      1. Fittings: Cast iron.
      2. Joint Seals: ASTM C564 neoprene gaskets, or lead and oakum.
   B. Cast Iron Pipe: CISPI 301, hubless, service weight.
      1. Fittings: Cast iron.
      2. Joints: CISPI 310, neoprene gaskets and stainless steel clamp-and-shield
         assemblies.

2.03 CHEMICAL RESISTANT SEWER PIPING
   A. Cast Iron Pipe: CISPI 301, hubless, service weight.
      1. Fittings: Cast iron.
      2. Joints: CISPI 310, neoprene gaskets and stainless steel clamp-and-shield
         assemblies.

2.04 DOMESTIC WATER PIPING, ABOVE GRADE
   A. Copper Tube: ASTM B88 (ASTM B88M), Type L (B), Drawn (H).
      1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and
         bronze.
      3. Mechanical Press Sealed Fittings: Double-pressed type, NSF 61 and NSF 372
         approved or certified, utilizing EPDM, nontoxic, synthetic rubber sealing elements.

2.05 NATURAL GAS PIPING, ABOVE GRADE
   A. Steel Pipe: ASTM A53/A53M Schedule 40 black.
      1. Fittings: ASME B16.3, malleable iron, or ASTM A234/A234M, wrought steel welding
         type.
      2. Joints: Threaded or welded to ASME B31.1.
2.06 FLANGES, UNIONS, AND COUPLINGS
A. Unions for Pipe Sizes 3 Inches and Under:
   1. Ferrous Pipe: Class 150 malleable iron threaded unions.
   2. Copper Tube and Pipe: Class 150 bronze unions with soldered joints.
B. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

2.07 PIPE HANGERS AND SUPPORTS
A. Provide hangers and supports that comply with MSS SP-58.
   1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
   2. Overhead Supports: Individual steel rod hangers attached to structure or to trapeze hangers.
   3. Trapeze Hangers: Welded steel channel frames attached to structure.
B. Plumbing Piping - Drain, Waste, and Vent:
   1. Hangers for Pipe Sizes 1/2 Inch to 1-1/2 Inches: Malleable iron, adjustable swivel, split ring.
   2. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
   3. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
C. Plumbing Piping - Water:
   1. Hangers for Pipe Sizes 1/2 Inch to 1-1/2 Inches: Malleable iron, adjustable swivel, split ring.
D. Hanger Fasteners: Attach hangers to structure using appropriate fasteners, as follows:

2.08 BALL VALVES
A. Manufacturers:
B. Construction, 4 Inches and Smaller: MSS SP-110, Class 150, 400 psi CWP, bronze body, 304 stainless steel ball, regular port, teflon seats and stuffing box ring, blow-out proof stem, 1/4-turn thumb or lever handle with balancing stops, solder ends with union.

PART 3 EXECUTION
3.01 PREPARATION
A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
B. Remove scale and dirt, on inside and outside, before assembly.
C. Prepare piping connections to equipment with flanges or unions.

3.02 INSTALLATION
A. Install in accordance with manufacturer's instructions.
B. Provide non-conductive dielectric connections wherever jointing dissimilar metals.
C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
D. Install piping to maintain headroom, conserve space, and not interfere with use of space.
E. Group piping whenever practical at common elevations.
F. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.

G. Provide access where valves and fittings are not exposed.
   1. Coordinate size and location of access doors with Section 083100.

H. Prepare exposed, unfinished pipe, fittings, supports, and accessories for finish painting.
   1. See Section 099123 for painting of interior plumbing systems and components.

I. Install water piping to ASME B31.9.

J. Copper Pipe and Tube: Make soldered joints in accordance with ASTM B828, using specified solder, and flux meeting ASTM B813; in potable water systems use flux also complying with NSF 61 and NSF 372.

K. Pipe Hangers and Supports:
   1. Install in accordance with ASME B31.9.
   2. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
   3. Place hangers within 12 inches of each horizontal elbow.
   4. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
   5. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
   6. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
   7. Provide copper plated hangers and supports for copper piping.
   8. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
      a. Painting of interior plumbing systems and components is specified in Section 099123.
   9. Support cast iron drainage piping at every joint.

L. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

3.03 APPLICATION

A. Install unions downstream of valves and at equipment or apparatus connections.

B. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.

C. Install ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.

3.04 TOLERANCES

A. Drainage Piping: Establish invert elevations within 1/2 inch vertically of location indicated and slope to drain at minimum of 1/4 inch per foot slope.

B. Water Piping: Slope at minimum of 1/32 inch per foot and arrange to drain at low points.

3.05 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

A. Prior to starting work, verify system is complete, flushed, and clean.

B. Ensure acidity (pH) of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).

C. Inject disinfectant, free chlorine in liquid, powder, tablet, or gas form throughout system to obtain 50 to 80 mg/L residual.

D. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.

E. Maintain disinfectant in system for 24 hours.
F. If final disinfectant residual tests less than 25 mg/L, repeat treatment.
G. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.
H. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

3.06 SCHEDULES
A. Pipe Hanger Spacing:
   1. Metal Piping:
      a. Pipe Size: 1/2 inches to 1-1/4 inches:
         1) Maximum Hanger Spacing: 6.5 ft.
         2) Hanger Rod Diameter: 3/8 inches.
      b. Pipe Size: 1-1/2 inches to 2 inches:
         1) Maximum Hanger Spacing: 10 ft.
         2) Hanger Rod Diameter: 3/8 inch.
      c. Pipe Size: 2-1/2 inches to 3 inches:
         1) Maximum Hanger Spacing: 10 ft.
         2) Hanger Rod Diameter: 1/2 inch.

END OF SECTION
SECTION 221006
PLUMBING PIPING SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Drains.
   B. Cleanouts.

1.02 REFERENCE STANDARDS

1.03 SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.
   C. Certificates: Certify that grease interceptors meet or exceed specified requirements.
   D. Project Record Documents: Record actual locations of equipment and cleanouts.

1.04 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING
   A. Accept specialties on site in original factory packaging. Inspect for damage.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS
   A. Specialties in Potable Water Supply Systems: Provide products that comply with NSF 61 and NSF 372 for maximum lead content.

2.02 DRAINS
   A. Manufacturers:
   B. Floor Drains: Refer to drawings.

2.03 CLEANOUTS
   A. Manufacturers:
   B. Cleanouts at Exterior Unsurfaced Areas:
      1. Line type with lacquered cast iron body and round epoxy coated gasketed cover.
   C. Cleanouts at Interior Finished Floor Areas:
      1. Lacquered cast iron body with anchor flange, reversible clamping collar, threaded top assembly, and round gasketed scored cover in service areas and round gasketed depressed cover to accept floor finish in finished floor areas.
   D. Cleanouts at Interior Finished Wall Areas:
      1. Line type with lacquered cast iron body and round epoxy coated gasketed cover, and round stainless steel access cover secured with machine screw.
E. Cleanouts at Interior Unfinished Accessible Areas: Calked or threaded type. Provide bolted stack cleanouts on vertical rainwater leaders.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.
B. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Ensure clearance at cleanout for rodding of drainage system.
C. Encase exterior cleanouts in concrete flush with grade.
D. Install floor cleanouts at elevation to accommodate finished floor.

END OF SECTION
SECTION 224500
EMERGENCY PLUMBING FIXTURES

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Emergency-fixture water-tempering system.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
   A. See Section 013000 - Administrative Requirements for submittal procedures.
   B. Product Data: Manufacturer's catalog sheets for fixtures.

PART 2 PRODUCTS

2.01 EMERGENCY-FIXTURE WATER-TEMPERING SYSTEM
   A. Manufacturers:
   B. Tepid Water Temperature: Set to 85 degrees F.
   C. Capacity: Sized for 300 gpm at 30 psi supply pressure.
   D. Cabinet: 16 gauge, 0.0598 inch stainless steel, surface-mounted with keyed lock.
   E. Above-freezing, Chemical-resistant System:

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that deck, wall and floor finishes are prepared and ready for fixture installation.

3.02 INSTALLATION
   A. Install fixtures and fittings in accordance with the manufacturer's instructions.
   B. Adjust water flow rates to comply with manufacturer's rating of the fixture.

3.03 FIELD QUALITY CONTROL
   A. See Section 014000 - Quality Requirements for additional requirements.
   B. Operational Tests: Upon completion and sterilization of plumbing systems, conduct operating tests to demonstrate satisfactory, functional, and operating efficiency.

3.04 CLEANING
   A. Thoroughly clean plumbing fixtures and equipment.

3.05 PROTECTION
   A. Protect installed products from damage due to subsequent construction operations.
   B. Repair or replace products damaged before Date of Substantial Completion.

END OF SECTION
SECTION 233100
HVAC DUCTS AND CASINGS

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Metal ductwork.
   B. Duct cleaning.

1.02 RELATED REQUIREMENTS
   A. Section 233300 - Air Duct Accessories.
   B. Section 233700 - Air Outlets and Inlets.

1.03 REFERENCE STANDARDS
   G. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible 2005 (Revised 2009).

1.04 SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. Project Record Documents: Record actual locations of ducts and duct fittings. Record changes in fitting location and type. Show additional fittings used.

1.05 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience, and approved by manufacturer.
   B. Installer Qualifications: Company specializing in performing the type of work specified in this section, with minimum three years of documented experience.

PART 2 PRODUCTS
2.01 DUCT ASSEMBLIES
   A. Regulatory Requirements: Construct ductwork to comply with NFPA 90A standards.
   B. Ducts: Galvanized steel, unless otherwise indicated.
   C. Low Pressure Supply (System with Cooling Coils): 1/2 inch w.g. pressure class, galvanized steel.
   D. Return and Relief: 1/2 inch w.g. pressure class, galvanized steel.

2.02 MATERIALS
   A. Galvanized Steel for Ducts: Hot-dipped galvanized steel sheet, ASTM A653/A653M FS Type B, with G60/Z180 coating.
   B. Joint Sealers and Sealants: Non-hardening, water resistant, mildew and mold resistant.
      1. Type: Heavy mastic or liquid used alone or with tape, suitable for joint configuration and compatible with substrates, and recommended by manufacturer for pressure class of ducts.
2. Surface Burning Characteristics: Flame spread index of zero and smoke developed index of zero, when tested in accordance with ASTM E84.

C. Hanger Rod: ASTM A36/A36M; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.

D. Hanger Fasteners: Attach hangers to structure using appropriate fasteners, as follows:
   3. Concrete Screw Type Anchors: Complying with ICC-ES AC193.
   4. Other Types: As required.

2.03 DUCTWORK FABRICATION
A. Fabricate and support in accordance with SMACNA (DCS) and as indicated.
B. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.
C. Construct T's, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows must be used, provide air foil turning vanes of perforated metal with glass fiber insulation.
D. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
E. Fabricate continuously welded round and oval duct fittings in accordance with SMACNA (DCS).

2.04 MANUFACTURED DUCTWORK AND FITTINGS
A. Spiral Ducts: Round spiral lockseam duct with galvanized steel outer wall.
   1. Manufacture in accordance with SMACNA (DCS).
B. Flexible Ducts: Two ply vinyl film supported by helically wound spring steel wire.
   1. Pressure Rating: 10 inches WG positive and 1.0 inches WG negative.
   3. Temperature Range: Minus 10 degrees F to 160 degrees F.
C. Round Duct Connection System: Interlocking duct connection system in accordance with SMACNA (DCS).

PART 3 EXECUTION
3.01 INSTALLATION
A. Install, support, and seal ducts in accordance with SMACNA (DCS).
B. Install in accordance with manufacturer's instructions.
C. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
D. Duct sizes indicated are inside clear dimensions. For lined ducts, maintain sizes inside lining.
E. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
F. Use double nuts and lock washers on threaded rod supports.
G. Connect diffusers or light troffer boots to low pressure ducts directly or with 5 feet maximum length of flexible duct held in place with strap or clamp.

3.02 CLEANING
A. Clean duct systems with high power vacuum machines. Protect equipment that could be harmed by excessive dirt with filters, or bypass during cleaning. Provide adequate access into ductwork for cleaning purposes.

END OF SECTION
SECTION 233300
AIR DUCT ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Duct access doors.
   B. Duct test holes.
   C. Flexible duct connectors.
   D. Volume control dampers.

1.02 RELATED REQUIREMENTS
   A. Section 233100 - HVAC Ducts and Casings.

1.03 REFERENCE STANDARDS
   B. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible 2005 (Revised 2009).

1.04 SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. Project Record Drawings: Record actual locations of access doors and test holes.

1.05 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING
   A. Protect dampers from damage to operating linkages and blades.

PART 2 PRODUCTS

2.01 DUCT ACCESS DOORS
   A. Fabricate in accordance with SMACNA (DCS) and as indicated.

2.02 DUCT TEST HOLES
   A. Temporary Test Holes: Cut or drill in ducts as required. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.

2.03 FLEXIBLE DUCT CONNECTORS
   A. Fabricate in accordance with SMACNA (DCS) and as indicated.
   B. Flexible Duct Connections: Fabric crimped into metal edging strip.

2.04 VOLUME CONTROL DAMPERS
   A. Manufacturers:
      5. Substitutions: See Section 016000 - Product Requirements.
   B. Single Blade Dampers:
      1. Fabricate for duct sizes up to 6 by 30 inch.
      2. Blade: 24 gauge, 0.0239 inch, minimum.
   C. Multi-Blade Damper: Fabricate of opposed blade pattern with maximum blade sizes 8 by 72 inch. Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.
D. End Bearings: Except in round ducts 12 inches and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon, thermoplastic elastomer, or sintered bronze bearings.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install accessories in accordance with manufacturer's instructions, NFPA 90A, and follow SMACNA (DCS). Refer to Section 233100 for duct construction and pressure class.

B. Provide duct test holes where indicated and required for testing and balancing purposes.

C. Provide balancing dampers at points on supply, return, and exhaust systems where branches are taken from larger ducts as required for air balancing. Install minimum 2 duct widths from duct take-off.

D. Provide balancing dampers on duct take-off to diffusers, grilles, and registers, regardless of whether dampers are specified as part of the diffuser, grille, or register assembly.

END OF SECTION
SECTION 233700
AIR OUTLETS AND INLETS

PART 1  GENERAL

1.01  REFERENCE STANDARDS

1.02  SUBMITTALS
A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.
C. Project Record Documents: Record actual locations of air outlets and inlets.

1.03  QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

PART 2  PRODUCTS

2.01  MANUFACTURERS
B. Nailor Industries, Inc.: www.nailor.com
F. Substitutions: See Section 016000 - Product Requirements.

PART 3  EXECUTION

3.01  INSTALLATION
A. Install in accordance with manufacturer's instructions.
B. Check location of outlets and inlets and make necessary adjustments in position to comply with architectural features, symmetry, and lighting arrangement.
C. Install diffusers to ductwork with air tight connection.
D. Provide balancing dampers on duct take-off to diffusers, and grilles and registers, despite whether dampers are specified as part of the diffuser, or grille and register assembly.

END OF SECTION
SECTION 260505
SELECTIVE DEMOLITION FOR ELECTRICAL

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Electrical demolition.

PART 3 EXECUTION
2.01 EXAMINATION
A. Verify field measurements and circuiting arrangements are as indicated.
B. Verify that abandoned wiring and equipment serve only abandoned facilities.
C. Demolition drawings are based on casual field observation and existing record documents.
D. Report discrepancies to Engineer before disturbing existing installation.
E. Beginning of demolition means installer accepts existing conditions.

2.02 PREPARATION
A. Disconnect electrical systems in walls, floors, and ceilings to be removed.
B. Coordinate utility service outages with utility company.
C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.
D. Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Minimize outage duration.
   1. Obtain permission from Owner at least 24 hours before partially or completely disabling system.

2.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK
A. Remove, relocate, and extend existing installations to accommodate new construction.
B. Remove abandoned wiring to source of supply.
C. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
D. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.
E. Repair adjacent construction and finishes damaged during demolition and extension work.
F. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.
G. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

2.04 CLEANING AND REPAIR
A. See Section 017419 - Construction Waste Management and Disposal for additional requirements.
B. Clean and repair existing materials and equipment that remain or that are to be reused.
C. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.

END OF SECTION
SECTION 260519
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Single conductor building wire.
B. Wiring connectors.
C. Electrical tape.
D. Heat shrink tubing.
E. Oxide inhibiting compound.
F. Wire pulling lubricant.
G. Cable ties.

1.02 RELATED REQUIREMENTS
A. Section 078400 - Firestopping.

1.03 REFERENCE STANDARDS
F. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
I. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
O. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape Current Edition, Including All Revisions.
1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
   2. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.
   3. Notify Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Project Record Documents: Record actual installed circuiting arrangements. Record actual routing of conduits 2" and larger.

1.06 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store conductors and cables in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 CONDUCTOR AND CABLE APPLICATIONS

A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.

B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.

2.02 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

A. Provide products that comply with requirements of NFPA 70.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Provide new conductors and cables manufactured not more than one year prior to installation.

D. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.

E. Comply with NEMA WC 70.

F. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.

G. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.

H. Conductors and Cables Installed Exposed in Spaces Used for Environmental Air (only where specifically permitted): Plenum rated, listed and labeled as suitable for use in return air plenums.
I. Conductor Material:
   1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.
   2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
   3. Tinned Copper Conductors: Comply with ASTM B33.

J. Minimum Conductor Size:
   1. Branch Circuits: 12 AWG.
      a. Exceptions:
         1) 20 A, 120 V circuits longer than 75 feet: 10 AWG, for voltage drop.
         2) 20 A, 120 V circuits longer than 150 feet: 8 AWG, for voltage drop.
         3) 20 A, 277 V circuits longer than 150 feet: 10 AWG, for voltage drop.

K. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

L. Conductor Color Coding:
   1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
   2. Color Coding Method: Integrally colored insulation.
   3. Color Code:
      a. 480Y/277 V, 3 Phase, 4 Wire System:
         1) Phase A: Brown.
         2) Phase B: Orange.
         3) Phase C: Yellow.
         4) Neutral/Grounded: Gray.
      b. 208Y/120 V, 3 Phase, 4 Wire System:
         1) Phase A: Black.
         2) Phase B: Red.
         3) Phase C: Blue.
         4) Neutral/Grounded: White.
      c. Equipment Ground, All Systems: Green.
      d. Travelers for 3-Way and 4-Way Switching: Pink.
      e. For modifications or additions to existing wiring systems, comply with existing color code when existing code complies with NFPA 70 and is approved by the authority having jurisdiction.

2.03 SINGLE CONDUCTOR BUILDING WIRE

A. Description: Single conductor insulated wire.

B. Conductor Stranding:
   1. Feeders and Branch Circuits:
      b. Size 8 AWG and Larger: Stranded.

C. Insulation Voltage Rating: 600 V.

D. Insulation:
   1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.
      a. Size 4 AWG and Larger: Type XHHW-2.
2.04 WIRING CONNECTORS
A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.
B. Wiring Connectors for Splices and Taps:
   1. Copper Conductors Size 8 AWG and Smaller: Use twist-on insulated spring connectors.
   2. Copper Conductors Size 6 AWG and Larger: Use mechanical connectors or compression connectors.
C. Do not use insulation-piercing or insulation-displacement connectors designed for use with conductors without stripping insulation.
D. Do not use push-in wire connectors as a substitute for twist-on insulated spring connectors.
E. Twist-on Insulated Spring Connectors: Rated 600 V, 221 degrees F for standard applications and 302 degrees F for high temperature applications; pre-filled with sealant and listed as complying with UL 486D for damp and wet locations.
F. Mechanical Connectors: Provide bolted type or set-screw type.
G. Compression Connectors: Provide circumferential type or hex type crimp configuration.

2.05 ACCESSORIES
A. Electrical Tape:
   1. Vinyl Color Coding Electrical Tape: Integrally colored to match color code indicated; listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; suitable for continuous temperature environment up to 221 degrees F.
   2. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F and suitable for continuous temperature environment up to 221 degrees F.
   3. Moisture Sealing Electrical Tape: Insulating mastic compound laminated to flexible, all-weather vinyl backing; minimum thickness of 90 mil.
B. Heat Shrink Tubing: Heavy-wall, split-resistant, with factory-applied adhesive; rated 600 V; suitable for direct burial applications; listed as complying with UL 486D.
C. Oxide Inhibiting Compound: Listed; suitable for use with the conductors or cables to be installed.
D. Wire Pulling Lubricant: Listed; suitable for use with the conductors or cables to be installed and suitable for use at the installation temperature.
E. Cable Ties: Material and tensile strength rating suitable for application.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that interior of building has been protected from weather.
B. Verify that work likely to damage wire and cable has been completed.
C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.
D. Verify that field measurements are as indicated.
E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION
A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.
3.03 INSTALLATION

A. Circuiting Requirements:
1. Unless dimensioned, circuit routing indicated is diagrammatic.
2. When circuit destination is indicated without specific routing, determine exact routing required.
3. Arrange circuiting to minimize splices.
4. Include circuit lengths required to install connected devices within 10 ft of location indicated.
5. Circuiting Adjustments: Unless otherwise indicated, when branch circuits are indicated as separate, combining them together in a single raceway is not permitted.
6. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among single phase branch circuits of different phases installed in the same raceway is not permitted. Provide dedicated neutral/grounded conductor for each individual branch circuit.

B. Install products in accordance with manufacturer’s instructions.

C. Perform work in accordance with NECA 1 (general workmanship).

D. Installation in Raceway:
1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
2. Pull all conductors and cables together into raceway at same time.
3. Do not damage conductors and cables or exceed manufacturer’s recommended maximum pulling tension and sidewall pressure.
4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.

E. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.

F. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.
1. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conductors and cables to lay on ceiling tiles.

G. Install conductors with a minimum of 12 inches of slack at each outlet.

H. Where conductors are installed in enclosures for future termination by others, provide a minimum of 5 feet of slack.

I. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.

J. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.

K. Make wiring connections using specified wiring connectors.
1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
3. Do not remove conductor strands to facilitate insertion into connector.
4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.
5. Mechanical Connectors: Secure connections according to manufacturer’s recommended torque settings.
6. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

L. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.
   1. Dry Locations: Use insulating covers specifically designed for the connectors.
   2. Damp Locations: Use heat shrink tubing.
      a. For taped connections, follow same procedure as for dry locations but apply outer covering of moisture sealing electrical tape.

M. Insulate ends of spare conductors using vinyl insulating electrical tape.

N. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 078400.

O. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

3.04 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for additional requirements.

B. Inspect and test in accordance with NETA ATS, except Section 4.

C. Perform inspections and tests listed in NETA ATS, Section 7.3.2. The insulation resistance test is not required. The resistance test for parallel conductors listed as optional is not required.

D. Correct deficiencies and replace damaged or defective conductors and cables.

END OF SECTION
SECTION 260526
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Grounding and bonding requirements.
B. Conductors for grounding and bonding.
C. Connectors for grounding and bonding.

1.02 RELATED REQUIREMENTS
A. Section 260519 - Low-Voltage Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.
B. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS
A. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
B. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 QUALITY ASSURANCE
A. Comply with requirements of NFPA 70.

PART 2 PRODUCTS
2.01 GROUNDING AND BONDING REQUIREMENTS
A. Do not use products for applications other than as permitted by NFPA 70 and product listing.
B. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.
C. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
D. Bonding and Equipment Grounding:
   1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.
   2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.
   3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.
   4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
   5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.
   6. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.
2.02 GROUNDING AND BONDING COMPONENTS

A. General Requirements:
   1. Provide products listed, classified, and labeled as suitable for the purpose intended.
   2. Provide products listed and labeled as complying with UL 467 where applicable.

B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 260526:
   1. Use insulated copper conductors unless otherwise indicated.
      a. Exceptions:
         1) Use bare copper conductors where installed underground in direct contact with earth.
         2) Use bare copper conductors where directly encased in concrete (not in raceway).

C. Connectors for Grounding and Bonding:
   1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
   2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.
   3. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that work likely to damage grounding and bonding system components has been completed.
B. Verify that field measurements are as indicated.
C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.
B. Perform work in accordance with NECA 1 (general workmanship).
C. Make grounding and bonding connections using specified connectors.
   1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
   2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
   3. Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer's recommendations.
   4. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
   5. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
D. Identify grounding and bonding system components in accordance with Section 260553.

END OF SECTION
SECTION 260529
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Support and attachment requirements and components for equipment, conduit, cable, boxes, and other electrical work.

1.02 RELATED REQUIREMENTS
A. Section 033000 - Cast-in-Place Concrete: Concrete equipment pads.

1.03 REFERENCE STANDARDS
D. MFMA 4 - Metal Framing Standards Publication 2004.
E. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
F. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordination:
1. Coordinate sizes and arrangement of supports and bases with the actual equipment and components to be installed.
2. Coordinate the work with other trades to provide additional framing and materials required for installation.
3. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.
4. Coordinate the arrangement of supports with ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
5. Notify Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
B. Sequencing:
1. Do not install products on or provide attachment to concrete surfaces until concrete has fully cured in accordance with Section 033000.

1.05 QUALITY ASSURANCE
A. Comply with NFPA 70.
B. Comply with applicable building code.
PART 2 PRODUCTS

2.01 SUPPORT AND ATTACHMENT COMPONENTS

A. General Requirements:
   1. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of electrical work.
   2. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
   3. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported. Include consideration for vibration, equipment operation, and shock loads where applicable.
   4. Do not use products for applications other than as permitted by NFPA 70 and product listing.
   5. Do not use wire, chain, perforated pipe strap, or wood for permanent supports unless specifically indicated or permitted.
      a. Indoor Dry Locations: Use zinc-plated steel unless otherwise indicated.
      b. Outdoor and Damp or Wet Indoor Locations: Use stainless steel unless otherwise indicated.
      c. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
      d. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.

B. Conduit and Cable Supports: Straps, clamps, etc. suitable for the conduit or cable to be supported.
   1. Conduit Straps: One-hole or two-hole type; malleable iron.
   2. Conduit Clamps: Bolted type unless otherwise indicated.

C. Outlet Box Supports: Hangers, brackets, etc. suitable for the boxes to be supported.

D. Metal Channel (Strut) Framing Systems: Factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.

E. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.
   1. Minimum Size, Unless Otherwise Indicated or Required:
      a. Equipment Supports: 1/2 inch diameter.
      b. Single Conduit up to 1 inch (27 mm) trade size: 1/4 inch diameter.
      c. Single Conduit larger than 1 inch (27 mm) trade size: 3/8 inch diameter.
      d. Trapeze Support for Multiple Conduits: 3/8 inch diameter.
      e. Outlet Boxes: 1/4 inch diameter.
      f. Luminaires: 1/4 inch diameter.

F. Anchors and Fasteners:
   1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.
   2. Concrete: Use expansion anchors.
   3. Solid or Grout-Filled Masonry: Use expansion anchors.
   7. Plastic and lead anchors are not permitted.
PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that field measurements are as indicated.
B. Verify that mounting surfaces are ready to receive support and attachment components.
C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION
A. Install products in accordance with manufacturer's instructions.
B. Perform work in accordance with NECA 1 (general workmanship).
C. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
D. Unless specifically indicated or approved by Engineer, do not provide support from suspended ceiling support system or ceiling grid.
E. Unless specifically indicated or approved by Engineer, do not provide support from roof deck.
F. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
G. Equipment Support and Attachment:
   1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
   2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
   3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
   4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
H. Secure fasteners according to manufacturer's recommended torque settings.
I. Remove temporary supports.

3.03 FIELD QUALITY CONTROL
A. See Section 014000 - Quality Requirements, for additional requirements.
B. Inspect support and attachment components for damage and defects.
C. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
D. Correct deficiencies and replace damaged or defective support and attachment components.

END OF SECTION
SECTION 260533.13
CONDUIT FOR ELECTRICAL SYSTEMS

PART 1  GENERAL

1.01  SECTION INCLUDES
A.  Galvanized steel rigid metal conduit (RMC).
B.  Intermediate metal conduit (IMC).
C.  Flexible metal conduit (FMC).
D.  Electrical metallic tubing (EMT).
E.  Conduit fittings.

1.02  RELATED REQUIREMENTS
A.  Section 078400 - Firestopping.
B.  Section 260526 - Grounding and Bonding for Electrical Systems.
C.  Section 260529 - Hangers and Supports for Electrical Systems.

1.03  REFERENCE STANDARDS
D.  NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
F.  NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable 2014.
G.  NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
H.  UL 1 - Flexible Metal Conduit Current Edition, Including All Revisions.
I.  UL 6 - Electrical Rigid Metal Conduit-Steel Current Edition, Including All Revisions.
J.  UL 514B - Conduit, Tubing, and Cable Fittings Current Edition, Including All Revisions.

1.04  ADMINISTRATIVE REQUIREMENTS
A.  Coordination:
1.  Coordinate minimum sizes of conduits with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
2.  Coordinate the arrangement of conduits with structural members, ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
3.  Verify exact conduit termination locations required for boxes, enclosures, and equipment installed under other sections or by others.
4.  Coordinate the work with other trades to provide roof penetrations that preserve the integrity of the roofing system and do not void the roof warranty.
5.  Notify Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
B.  Sequencing:
1.  Do not begin installation of conductors and cables until installation of conduit is complete between outlet, junction and splicing points.
1.05 SUBMITTALS
   A. See Section 013000 - Administrative Requirements for submittals procedures.
   B. Project Record Documents: Record actual routing for conduits installed underground, conduits embedded within concrete slabs, and conduits 2 inch (53 mm) trade size and larger.

1.06 QUALITY ASSURANCE
   A. Comply with requirements of NFPA 70.

1.07 DELIVERY, STORAGE, AND HANDLING
   A. Receive, inspect, handle, and store conduit and fittings in accordance with manufacturer’s instructions.

PART 2 PRODUCTS

2.01 CONDUIT APPLICATIONS
   A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70 and product listing.
   B. Unless otherwise indicated and where not otherwise restricted, use the conduit types indicated for the specified applications. Where more than one listed application applies, comply with the most restrictive requirements. Where conduit type for a particular application is not specified, use galvanized steel rigid metal conduit.
   C. Concealed Within Masonry Walls: Use electrical metallic tubing (EMT).
   D. Concealed Within Hollow Stud Walls: Use electrical metallic tubing (EMT).
   E. Concealed Above Accessible Ceilings: Use galvanized steel rigid metal conduit or electrical metallic tubing (EMT).
   F. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).
      1. Locations subject to physical damage include, but are not limited to:
         a. Where exposed below 8 feet, except within electrical and communication rooms or closets.
   G. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).
   H. Connections to Luminaires Above Accessible Ceilings: Use flexible metal conduit.
      1. Maximum Length: 6 feet.

2.02 CONDUIT REQUIREMENTS
   A. Existing Work: Where existing conduits are indicated to be reused, they may be reused only where they comply with specified requirements, are free from corrosion, and integrity is verified by pulling a mandrel through them.
   B. Provide all conduit, fittings, supports, and accessories required for a complete raceway system.
   C. Provide products listed, classified, and labeled as suitable for the purpose intended.
   D. Minimum Conduit Size, Unless Otherwise Indicated:
      1. Branch Circuits: 1/2 inch (16 mm) trade size.
      2. Branch Circuit Homeruns: 3/4 inch (21 mm) trade size.
      3. Flexible Connections to Luminaires: 3/8 inch (12 mm) trade size.
   E. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
2.03 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.

B. Fittings:
   1. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   2. Material: Use steel or malleable iron.
      a. Do not use die cast zinc fittings.
   3. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.04 INTERMEDIATE METAL CONDUIT (IMC)

A. Description: NFPA 70, Type IMC galvanized steel intermediate metal conduit complying with ANSI C80.6 and listed and labeled as complying with UL 1242.

B. Fittings:
   1. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   2. Material: Use steel or malleable iron.
   3. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.05 FLEXIBLE METAL CONDUIT (FMC)

A. Description: NFPA 70, Type FMC standard wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems to be used.

B. Fittings:
   1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   2. Material: Use steel or malleable iron.

2.06 ELECTRICAL METALLIC TUBING (EMT)

A. Description: NFPA 70, Type EMT steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.

B. Fittings:
   1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   2. Material: Use steel or malleable iron.
      a. Do not use die cast zinc fittings.
   3. Connectors and Couplings: Use compression (gland) or set-screw type.
      a. Do not use indenter type connectors and couplings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.
B. Verify that mounting surfaces are ready to receive conduits.
C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.
B. Perform work in accordance with NECA 1 (general workmanship).
C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.
D. Install intermediate metal conduit (IMC) in accordance with NECA 101.
E. Conduit Routing:
1. Unless dimensioned, conduit routing indicated is diagrammatic.
2. When conduit destination is indicated without specific routing, determine exact routing required.
3. Conceal all conduits unless specifically indicated to be exposed.
4. Conduits in the following areas may be exposed, unless otherwise indicated:
   a. Within joists in areas with no ceiling.
5. Unless otherwise approved, do not route conduits exposed:
   a. Across floors.
   b. Across roofs.
   c. Across top of parapet walls.
   d. Across building exterior surfaces.
6. Arrange conduit to maintain adequate headroom, clearances, and access.
7. Arrange conduit to provide no more than the equivalent of four 90 degree bends between pull points.
8. Arrange conduit to provide no more than 150 feet between pull points.
9. Route conduits above water and drain piping where possible.
10. Arrange conduit to prevent moisture traps. Provide drain fittings at low points and at sealing fittings where moisture may collect.
11. Maintain minimum clearance of 6 inches between conduits and piping for other systems.
12. Maintain minimum clearance of 12 inches between conduits and hot surfaces.
13. Group parallel conduits in the same area together on a common rack.

F. Conduit Support:
1. Secure and support conduits in accordance with NFPA 70 and Section 260529 using suitable supports and methods approved by the authority having jurisdiction.
2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
3. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conduits to lay on ceiling tiles.
4. Use conduit strap to support single surface-mounted conduit.
   a. Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit and mounting surface.
5. Use metal channel (strut) with accessory conduit clamps to support multiple parallel surface-mounted conduits.
6. Use conduit clamp to support single conduit from beam clamp or threaded rod.
7. Use trapeze hangers assembled from threaded rods and metal channel (strut) with accessory conduit clamps to support multiple parallel suspended conduits.
8. Use non-penetrating rooftop supports to support conduits routed across rooftops (only where approved).
9. Use of wire for support of conduits is not permitted.
10. Where conduit support intervals specified in NFPA 70 and NECA standards differ, comply with the most stringent requirements.

G. Connections and Terminations:
1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
3. Use suitable adapters where required to transition from one type of conduit to another.
4. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
5. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.
6. Secure joints and connections to provide maximum mechanical strength and electrical continuity.

H. Penetrations:
1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
2. Make penetrations perpendicular to surfaces unless otherwise indicated.
3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
4. Conceal bends for conduit risers emerging above ground.
5. Seal interior of conduits entering the building from underground at first accessible point to prevent entry of moisture and gases.
6. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
7. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated or as required to preserve integrity of roofing system and maintain roof warranty. Include proposed locations of penetrations and methods for sealing with submittals.
8. Provide metal escutcheon plates for conduit penetrations exposed to public view.
9. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 078400.

I. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:
1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
2. Where conduits are subject to earth movement by settlement or frost.

J. Condensation Prevention: Where conduits cross barriers between areas of potential substantial temperature differential, provide sealing fitting or approved sealing compound at an accessible point near the penetration to prevent condensation. This includes, but is not limited to:
1. Where conduits pass from outdoors into conditioned interior spaces.
2. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.

K. Provide grounding and bonding in accordance with Section 260526.

3.03 FIELD QUALITY CONTROL
A. See Section 014000 - Quality Requirements, for additional requirements.
B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
C. Correct deficiencies and replace damaged or defective conduits.

3.04 CLEANING
A. Clean interior of conduits to remove moisture and foreign matter.

3.05 PROTECTION
A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

END OF SECTION
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SECTION 260533.16
BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Outlet and device boxes up to 100 cubic inches, including those used as junction and pull boxes.
B. Cabinets and enclosures, including junction and pull boxes larger than 100 cubic inches.

1.02 RELATED REQUIREMENTS

A. Section 083100 - Access Doors and Panels: Panels for maintaining access to concealed boxes.
B. Section 260529 - Hangers and Supports for Electrical Systems.
C. Section 260533.13 - Conduit for Electrical Systems:
   1. Conduit bodies and other fittings.
   2. Additional requirements for locating boxes to limit conduit length and/or number of bends between pulling points.
D. Section 260553 - Identification for Electrical Systems: Identification products and requirements.
E. Section 262726 - Wiring Devices:
   1. Wall plates.
   2. Additional requirements for locating boxes for wiring devices.
F. Section 271000 - Structured Cabling: Additional requirements for communications systems outlet boxes.

1.03 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
C. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable 2014.
D. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports 2013.
F. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
   2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
   3. Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to NFPA 70.
4. Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated according to NFPA 70.
5. Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc. installed under other sections or by others.
6. Coordinate the work with other trades to preserve insulation integrity.
7. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated.
8. Notify Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS
A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for floor boxes.
C. Project Record Documents: Record actual locations for outlet and device boxes, pull boxes, cabinets and enclosures, and floor boxes.

1.06 QUALITY ASSURANCE
A. Comply with requirements of NFPA 70.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS
2.01 BOXES
A. General Requirements:
   1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
   2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
   3. Provide products listed, classified, and labeled as suitable for the purpose intended.
   4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
   5. Provide grounding terminals within boxes where equipment grounding conductors terminate.
   6. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
   7. Use cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
   8. Use suitable masonry type boxes where flush-mounted in masonry walls.
   9. Use raised covers suitable for the type of wall construction and device configuration where required.
   10. Use shallow boxes where required by the type of wall construction.
   11. Do not use "through-wall" boxes designed for access from both sides of wall.
   12. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
   13. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
10. Minimum Box Size, Unless Otherwise Indicated:
   a. Wiring Devices (Other Than Communications Systems Outlets): 4 inch square by 1-1/2 inch deep (100 by 38 mm) trade size.
   b. Communications Systems Outlets: Comply with Section 271000.

11. Wall Plates: Comply with Section 262726.

C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches:
   1. Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
   2. NEMA 250 Environment Type, Unless Otherwise Indicated:
      a. Indoor Clean, Dry Locations: Type 1, painted steel.
      b. Outdoor Locations: Type 3R, painted steel.
   3. Junction and Pull Boxes Larger Than 100 cubic inches:
      a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.
   4. Finish for Painted Steel Enclosures: Manufacturer's standard grey unless otherwise indicated.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that field measurements are as indicated.
   B. Verify that mounting surfaces are ready to receive boxes.
   C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION
   A. Install products in accordance with manufacturer's instructions.
   B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.
   C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
   D. Flush-mount boxes in finished areas unless specifically indicated to be surface-mounted.
   E. Unless otherwise indicated, boxes may be surface-mounted where exposed conduits are indicated or permitted.
   F. Box Locations:
      1. Locate boxes to be accessible. Provide access panels in accordance with Section 083100 as required where approved by the Architect.
      2. Unless dimensioned, box locations indicated are approximate.
      3. Locate boxes as required for devices installed under other sections or by others.
         a. Switches, Receptacles, and Other Wiring Devices: Comply with Section 262726.
         b. Communications Systems Outlets: Comply with Section 271000.
      4. Locate boxes so that wall plates do not span different building finishes.
      5. Locate boxes so that wall plates do not cross masonry joints.
      6. Unless otherwise indicated, where multiple outlet boxes are installed at the same location at different mounting heights, install along a common vertical center line.
      7. Do not install flush-mounted boxes on opposite sides of walls back-to-back. Provide minimum 6 inches horizontal separation unless otherwise indicated.
      8. Fire Resistance Rated Walls: Install flush-mounted boxes such that the required fire resistance will not be reduced.
      9. Locate junction and pull boxes as indicated, as required to facilitate installation of conductors, and to limit conduit length and/or number of bends between pulling points in accordance with Section 260533.13.
10. Locate junction and pull boxes in the following areas, unless otherwise indicated or approved by the Architect:
   a. Concealed above accessible suspended ceilings.

G. Box Supports:
   1. Secure and support boxes in accordance with NFPA 70 and Section 260529 using suitable supports and methods approved by the authority having jurisdiction.
   2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.
   3. Installation Above Suspended Ceilings: Do not provide support from ceiling grid or ceiling support system.
   4. Use far-side support to secure flush-mounted boxes supported from single stud in hollow stud walls. Repair or replace supports for boxes that permit excessive movement.

H. Install boxes plumb and level.

I. Flush-Mounted Boxes:
   1. Install boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that front edge of box or associated raised cover is not set back from finished surface more than 1/4 inch or does not project beyond finished surface.
   2. Install boxes in combustible materials such as wood so that front edge of box or associated raised cover is flush with finished surface.
   3. Repair rough openings around boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that there are no gaps or open spaces greater than 1/8 inch at the edge of the box.

J. Install boxes as required to preserve insulation integrity.

K. Metallic Floor Boxes: Install box level at the proper elevation to be flush with finished floor.

L. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

M. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 078400.

N. Close unused box openings.

O. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.

P. Provide grounding and bonding in accordance with Section 260526.

Q. Identify boxes in accordance with Section 260553.

3.03 CLEANING
   A. Clean interior of boxes to remove dirt, debris, plaster and other foreign material.

3.04 PROTECTION
   A. Immediately after installation, protect boxes from entry of moisture and foreign material until ready for installation of conductors.

END OF SECTION
SECTION 260533.23
SURFACE RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Surface raceway systems.

1.02 RELATED REQUIREMENTS
A. Section 260526 - Grounding and Bonding for Electrical Systems.
B. Section 260529 - Hangers and Supports for Electrical Systems.
C. Section 260533.13 - Conduit for Electrical Systems.
D. Section 260533.16 - Boxes for Electrical Systems.
E. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS
A. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
B. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
C. UL 5 - Surface Metal Raceways and Fittings Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordination:
   1. Coordinate the placement of raceways with millwork, furniture, equipment, etc. installed under other sections or by others.
   2. Coordinate rough-in locations of outlet boxes provided under Section 260533.16 and conduit provided under Section 260533.13 as required for installation of raceways provided under this section.
   3. Verify minimum sizes of raceways with the actual conductors and components to be installed.
   4. Notify Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
B. Sequencing:
   1. Do not install raceways until final surface finishes and painting are complete.
   2. Do not begin installation of conductors and cables until installation of raceways is complete between outlet, junction and splicing points.

1.05 SUBMITTALS
A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer’s standard catalog pages and data sheets including dimensions, knockout sizes and locations, materials, fabrication details, finishes, service condition requirements, and accessories.
   1. Surface Raceway Systems: Include information on fill capacities for conductors and cables.
1.06 QUALITY ASSURANCE
   A. Comply with requirements of NFPA 70.
   B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING
   A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS
2.01 RACEWAY REQUIREMENTS
   A. Provide all components, fittings, supports, and accessories required for a complete raceway system.
   B. Provide products listed, classified, and labeled as suitable for the purpose intended.
   C. Do not use raceways for applications other than as permitted by NFPA 70 and product listing.

2.02 SURFACE RACEWAY SYSTEMS
   A. Manufacturers:
      2. Wiremold, a brand of Legrand North America, Inc: www.legrand.us.
   B. Surface Metal Raceways: Listed and labeled as complying with UL 5.
   C. Surface Nonmetallic Raceways: Listed and labeled as complying with UL 5A.
   D. Multioutlet Assemblies: Listed and labeled as complying with UL 111.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify that field measurements are as indicated.
   B. Verify that outlet boxes and conduit terminations are installed in proper locations and are properly sized in accordance with NFPA 70 to accommodate raceways.
   C. Verify that mounting surfaces are ready to receive raceways and that final surface finishes are complete, including painting.
   D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION
   A. Install products in accordance with manufacturer's instructions.
   B. Perform work in accordance with NECA 1 (general workmanship).
   C. Install raceways plumb and level.
   D. Arrange wireways and associated raceway connections to comply with NFPA 70, including but not limited to requirements for deflected conductors and wireways used as pullboxes. Increase size of wireway where necessary.
   E. Secure and support raceways in accordance with Section 260529 at intervals complying with NFPA 70 and manufacturer's requirements.
   F. Close unused raceway openings.
   G. Provide grounding and bonding in accordance with Section 260526.
   H. Identify raceways in accordance with Section 260553.
3.03 **FIELD QUALITY CONTROL**
   A. See Section 014000 - Quality Requirements, for additional requirements.
   B. Inspect raceways for damage and defects.
   C. Surface Raceway Systems with Integrated Devices: Test each wiring device to verify operation and proper polarity.
   D. Correct wiring deficiencies and replace damaged or defective raceways.

3.04 **CLEANING**
   A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

3.05 **PROTECTION**
   A. Protect installed raceways from subsequent construction operations.

**END OF SECTION**
SECTION 260553
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electrical identification requirements.
B. Identification nameplates and labels.
C. Wire and cable markers.
D. Voltage markers.
E. Warning signs and labels.

1.02 RELATED REQUIREMENTS

A. Section 260519 - Low-Voltage Electrical Power Conductors and Cables: Color coding for power conductors and cables 600 V and less; vinyl color coding electrical tape.
B. Section 262726 - Wiring Devices - Lutron: Device and wallplate finishes; factory pre-marked wallplates.
C. Section 271000 - Structured Cabling: Identification for communications cabling and devices.

1.03 REFERENCE STANDARDS

C. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Verify final designations for equipment, systems, and components to be identified prior to fabrication of identification products.
B. Sequencing:
   1. Do not conceal items to be identified, in locations such as above suspended ceilings, until identification products have been installed.
   2. Do not install identification products until final surface finishes and painting are complete.

1.05 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

PART 2 PRODUCTS

2.01 IDENTIFICATION REQUIREMENTS

A. Identification for Equipment:
   1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.
B. Identification for Conductors and Cables:
   1. Color Coding for Power Conductors 600 V and Less: Comply with Section 260519.
   2. Identification for Communications Conductors and Cables: Comply with Section 271000.
   3. Use identification nameplate or identification label to identify color code for ungrounded and grounded power conductors inside door or enclosure at each piece of feeder or branch-circuit distribution equipment when premises has feeders or branch circuits served by more than one nominal voltage system.
   4. Use wire and cable markers to identify circuit number or other designation indicated for power, control, and instrumentation conductors and cables at the following locations:
      a. Within boxes when more than one circuit is present.
      b. In cable tray, at maximum intervals of 20 feet.

C. Identification for Raceways:
   1. Use voltage markers to identify highest voltage present for accessible conduits at maximum intervals of 20 feet.

D. Identification for Boxes:
   1. Use voltage markers to identify highest voltage present.
   2. Use identification labels to identify circuits enclosed.
      a. For exposed boxes in public areas, provide identification on inside face of cover.

E. Identification for Devices:
   1. Identification for Communications Devices: Comply with Section 271000.
   2. Wiring Device and Wallplate Finishes: Comply with Section 262726.
   3. Use identification label or engraved wallplate to identify serving branch circuit for all receptacles.
      a. For receptacles in public areas or in areas as directed by Architect, provide identification on inside surface of wallplate.
   4. Use identification label or engraved wallplate to identify load controlled for wall-mounted control devices controlling loads that are not visible from the control location and for multiple wall-mounted control devices installed at one location.

2.02 IDENTIFICATION NAMEPLATES AND LABELS

A. Identification Nameplates:
   1. Materials:
      a. Indoor Clean, Dry Locations: Use plastic nameplates.
      b. Outdoor Locations: Use stainless steel nameplates suitable for exterior use.
   2. Plastic Nameplates: Two-layer or three-layer laminated acrylic or electrically non-conductive phenolic with beveled edges; minimum thickness of 1/16 inch; engraved text.
   3. Stainless Steel Nameplates: Minimum thickness of 1/32 inch; engraved or laser-etched text.
   4. Mounting Holes for Mechanical Fasteners: Two, centered on sides for sizes up to 1 inch high; Four, located at corners for larger sizes.

B. Identification Labels:
   1. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.
      a. Use only for indoor locations.
   2. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.
C. Format for Receptacle Identification:
   1. Minimum Size: 3/8 inch by 1.5 inches.
   2. Legend: Power source and circuit number or other designation indicated.
      a. Include voltage and phase for other than 120 V, single phase circuits.
   3. Text: All capitalized unless otherwise indicated.
   5. Color: Black text on clear background.

D. Format for Control Device Identification:
   1. Minimum Size: 3/8 inch by 1.5 inches.
   2. Legend: Load controlled or other designation indicated.
   3. Text: All capitalized unless otherwise indicated.
   5. Color: Black text on clear background.

2.03 WIRE AND CABLE MARKERS

A. Markers for Conductors and Cables: Use wrap-around self-adhesive vinyl cloth, wrap-around self-adhesive vinyl self-laminating, heat-shrink sleeve, plastic sleeve, plastic clip-on, or vinyl split sleeve type markers suitable for the conductor or cable to be identified.

B. Markers for Conductor and Cable Bundles: Use plastic marker tags secured by nylon cable ties.

C. Legend: Power source and circuit number or other designation indicated.

D. Text: Use factory pre-printed or machine-printed text, all capitalized unless otherwise indicated.
   1. Do not use handwritten text.

E. Minimum Text Height: 1/8 inch.

F. Color: Black text on white background unless otherwise indicated.

2.04 VOLTAGE MARKERS

A. Markers for Conduits: Use factory pre-printed self-adhesive vinyl, self-adhesive vinyl cloth, or vinyl snap-around type markers.

B. Markers for Boxes and Equipment Enclosures: Use factory pre-printed self-adhesive vinyl or self-adhesive vinyl cloth type markers.

C. Minimum Size:
   1. Markers for Conduits: As recommended by manufacturer for conduit size to be identified.
   2. Markers for Pull Boxes: 1 1/8 by 4 1/2 inches.

D. Legend:
   1. Markers for Voltage Identification: Highest voltage present.

E. Color: Black text on orange background unless otherwise indicated.

2.05 WARNING SIGNS AND LABELS

A. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.

B. Warning Signs:
   1. Materials:
   2. Minimum Size: 7 by 10 inches unless otherwise indicated.
C. Warning Labels:
   1. Materials: Use factory pre-printed or machine-printed self-adhesive polyester or self-adhesive vinyl labels; UV, chemical, water, heat, and abrasion resistant; produced using materials recognized to UL 969.
   3. Minimum Size: 2 by 4 inches unless otherwise indicated.

PART 3 EXECUTION

3.01 PREPARATION
   A. Clean surfaces to receive adhesive products according to manufacturer's instructions.

3.02 INSTALLATION
   A. Install products in accordance with manufacturer's instructions.
   B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:
      3. Free-Standing Equipment: Enclosure front; also enclosure rear for equipment with rear access.
      4. Elevated Equipment: Legible from the floor or working platform.
      5. Interior Components: Legible from the point of access.
      6. Conduits: Legible from the floor.
      7. Boxes: Outside face of cover.
      8. Conductors and Cables: Legible from the point of access.
   C. Install identification products centered, level, and parallel with lines of item being identified.
   D. Secure nameplates to exterior surfaces of enclosures using stainless steel screws and to interior surfaces using self-adhesive backing or epoxy cement.
   E. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.

3.03 FIELD QUALITY CONTROL
   A. See Section 014000 - Quality Requirements, for additional requirements.
   B. Replace self-adhesive labels and markers that exhibit bubbles, wrinkles, curling or other signs of improper adhesion.

END OF SECTION
SECTION 260923
LIGHTING CONTROL DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Occupancy sensors.

1.02 RELATED REQUIREMENTS
   A. Section 260529 - Hangers and Supports for Electrical Systems
   B. Section 260533.16 - Boxes for Electrical Systems.
   C. Section 262726 - Wiring Devices: Devices for manual control of lighting, including wall switches, wall dimmers, and fan speed controllers.

1.03 REFERENCE STANDARDS
   A. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
   C. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 ADMINISTRATIVE REQUIREMENTS
   A. Coordination:
      1. Coordinate the placement of lighting control devices with millwork, furniture, equipment, etc. installed under other sections or by others.
      2. Coordinate the placement of occupancy sensors with millwork, furniture, equipment or other potential obstructions to motion detection coverage installed under other sections or by others.
      3. Notify Engineer of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

1.05 SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Include ratings, configurations, standard wiring diagrams, dimensions, colors, service condition requirements, and installed features.
   C. Field Quality Control Reports.
   D. Operation and Maintenance Data: Include detailed information on device programming and setup.
   E. Project Record Documents: Record actual installed locations and settings for lighting control devices.

1.06 QUALITY ASSURANCE
   A. Comply with requirements of NFPA 70.
   B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.07 DELIVERY, STORAGE, AND PROTECTION
   A. Store products in a clean, dry space in original manufacturer's packaging in accordance with manufacturer's written instructions until ready for installation.

1.08 WARRANTY
   A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
   B. Provide five year manufacturer warranty for all occupancy sensors.
PART 2 PRODUCTS

2.01 LIGHTING CONTROL DEVICES - GENERAL REQUIREMENTS

A. Provide products listed, classified, and labeled as suitable for the purpose intended.

B. Unless specifically indicated to be excluded, provide all required conduit, wiring, connectors, hardware, components, accessories, etc. as required for a complete operating system.

2.02 OCCUPANCY SENSORS

A. Manufacturers:
   5. Source Limitations: Furnish products produced by a single manufacturer and obtained from a single supplier.

B. All Occupancy Sensors:
   1. Description: Factory-assembled commercial specification grade devices for indoor use capable of sensing both major motion, such as walking, and minor motion, such as small desktop level movements, according to published coverage areas, for automatic control of load indicated.
   2. Sensor Technology:
      a. Passive Infrared/Ultrasonic Dual Technology Occupancy Sensors: Designed to detect occupancy using a combination of both passive infrared and ultrasonic technologies.
   3. Provide LED to visually indicate motion detection with separate color LEDs for each sensor type in dual technology units.
   4. Operation: Unless otherwise indicated, occupancy sensor to turn load on when occupant presence is detected and to turn load off when no occupant presence is detected during an adjustable turn-off delay time interval.
   5. Dual Technology Occupancy Sensors: Field configurable turn-on and hold-on activation with settings for activation by either or both sensing technologies.
   6. Turn-Off Delay: Field adjustable, with time delay settings up to 30 minutes.
   7. Sensitivity: Field adjustable.
   8. Adaptive Technology: Field selectable; capable of self-adjusting sensitivity and time delay according to conditions.
   9. Compatibility (Non-Dimming Sensors): Suitable for controlling incandescent lighting, low-voltage lighting with electronic and magnetic transformers, fluorescent lighting with electronic and magnetic ballasts, and fractional motor loads, with no minimum load requirements.
   10. Where wired sensors are indicated, wireless sensors are not acceptable without prior approval of Architect.

C. Ceiling Mounted Occupancy Sensors:
   1. All Ceiling Mounted Occupancy Sensors:
      a. Description: Low profile occupancy sensors designed for ceiling installation.
      b. Unless otherwise indicated or required to control the load indicated on drawings, provide low voltage units, for use with separate compatible accessory power packs.
      c. Occupancy sensor to be field selectable as either manual-on/automatic-off or automatic on/off.
      d. Finish: White unless otherwise indicated.
2. Passive Infrared/Ultrasonic Dual Technology Ceiling Mounted Occupancy Sensors:
   a. Standard Range Sensors: Capable of detecting motion within an area of 450 square feet at a mounting height of 9 feet, with a field of view of 360 degrees.
   b. Extended Range Sensors: Capable of detecting motion within an area of 1,200 square feet at a mounting height of 9 feet, with a field of view of 360 degrees.

D. Power Packs for Low Voltage Occupancy Sensors:
   1. Description: Plenum rated, self-contained low voltage class 2 transformer and relay compatible with specified low voltage occupancy sensors for switching of line voltage loads.
   2. Provide quantity and configuration of power and slave packs with all associated wiring and accessories as required to control the load indicated on drawings.
   3. Input Supply Voltage: Dual rated for 120/277 V ac.
   4. Load Rating: As required to control the load indicated on drawings.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that field measurements are as indicated.
   B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.
   C. Verify that openings for outlet boxes are neatly cut and will be completely covered by devices or wall plates.
   D. Verify that final surface finishes are complete, including painting.
   E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to lighting control devices.
   F. Verify that the service voltage and ratings of lighting control devices are appropriate for the service voltage and load requirements at the location to be installed.
   G. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION
   A. Provide extension rings to bring outlet boxes flush with finished surface.
   B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION
   A. Install lighting control devices in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.
   B. Coordinate locations of outlet boxes provided under Section 260533.16 as required for installation of lighting control devices provided under this section.
   C. Install lighting control devices in accordance with manufacturer's instructions.
   D. Unless otherwise indicated, connect lighting control device grounding terminal or conductor to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
   E. Install lighting control devices plumb and level, and held securely in place.
   F. Where required and not furnished with lighting control device, provide wall plate in accordance with Section 262726.
   G. Provide required supports in accordance with Section 260529.
   H. Where applicable, install lighting control devices and associated wall plates to fit completely flush to mounting surface with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.
I. Occupancy Sensor Locations:
   1. Location Adjustments: Within the design intent, reasonably minor adjustments to locations may be made in order to optimize coverage and avoid conflicts or problems affecting coverage.
   2. Locate ultrasonic and dual technology passive infrared/ultrasonic occupancy sensors a minimum of 4 feet from air supply ducts or other sources of heavy air flow and as per manufacturer's recommendations, in order to minimize false triggers.

J. Unless otherwise indicated, install power packs for lighting control devices above accessible ceiling or above access panel in inaccessible ceiling near the sensor location.

K. Where indicated, install separate compatible wall switches for manual control interface with lighting control devices or associated power packs.

L. Unless otherwise indicated, install switches on load side of power packs so that switch does not turn off power pack.

3.04 FIELD QUALITY CONTROL
   A. See Section 014000 - Quality Requirements, for additional requirements.
   B. Inspect each lighting control device for damage and defects.
   C. Test occupancy sensors to verify proper operation, including time delays and ambient light thresholds where applicable. Verify optimal coverage for entire room or area. Record test results in written report to be included with submittals.
   D. Correct wiring deficiencies and replace damaged or defective lighting control devices.

3.05 ADJUSTING
   A. Adjust devices and wall plates to be flush and level.
   B. Adjust occupancy sensor settings to minimize undesired activations while optimizing energy savings, and to achieve desired function as indicated or as directed by Engineer.
   C. Where indicated or as directed by Architect, install factory masking material or adjust integral blinders on passive infrared (PIR) and dual technology occupancy sensor lenses to block undesired motion detection.

3.06 CLEANING
   A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

3.07 CLOSEOUT ACTIVITIES
   A. Demonstration: Demonstrate proper operation of lighting control devices to Engineer, and correct deficiencies or make adjustments as directed.
   B. Training: Train Owner's personnel on operation, adjustment, programming, and maintenance of lighting control devices.
      1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
      2. Provide minimum of two hours of training.
      3. Instructor: Qualified contractor familiar with the project and with sufficient knowledge of the installed lighting control devices.
      4. Location: At project site.

END OF SECTION
SECTION 262726
WIRING DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Wall switches.
   B. Wall dimmers.
   C. Receptacles.
   D. Wall plates.
   E. Floor box service fittings.

1.02 RELATED REQUIREMENTS
   A. Section 260533.16 - Boxes for Electrical Systems.
   B. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS
   B. FS W-S-896 - Switches, Toggle (Toggle and Lock), Flush-mounted (General Specification) 2017g.
   E. NEMA WD 1 - General Color Requirements for Wiring Devices 1999 (Reaffirmed 2015).
   F. NEMA WD 6 - Wiring Devices - Dimensional Specifications 2016.
   G. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 ADMINISTRATIVE REQUIREMENTS
   A. Coordination:
      1. Coordinate the placement of outlet boxes with millwork, furniture, equipment, etc. installed under other sections or by others.
      2. Coordinate wiring device ratings and configurations with the electrical requirements of actual equipment to be installed.
      3. Coordinate the installation and preparation of uneven surfaces, such as split face block, to provide suitable surface for installation of wiring devices.
      4. Notify Engineer of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

1.05 SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.
   C. Operation and Maintenance Data:
      1. GFCI Receptacles: Include information on status indicators.
D. Project Record Documents: Record actual installed locations of wiring devices.

1.06 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.
B. Products: Listed, classified, and labeled as suitable for the purpose intended.

PART 2 PRODUCTS

2.01 WIRING DEVICE APPLICATIONS

A. Provide wiring devices suitable for intended use and with ratings adequate for load served.
B. For single receptacles installed on an individual branch circuit, provide receptacle with ampere rating not less than that of the branch circuit.
C. Provide GFCI protection for receptacles installed within 6 feet of sinks.
D. Unless noted otherwise, do not use combination switch/receptacle devices.

2.02 WIRING DEVICE FINISHES

A. Provide wiring device finishes as described below unless otherwise indicated.
B. Wiring Devices: device finish to be selected by architect via submittal process with stainless steel faceplate, to be confirmed via submittal process.

2.03 WALL SWITCHES

A. Manufacturers:
B. Wall Switches - General Requirements: AC only, quiet operating, general-use snap switches with silver alloy contacts, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 20 and where applicable, FS W-S-896; types as indicated on the drawings.
   1. Wiring Provisions: Terminal screws for side wiring and screw actuated binding clamp for back wiring with separate ground terminal screw.
C. Standard Wall Switches: Industrial specification grade, 20 A, 120/277 V with standard toggle type switch actuator and maintained contacts; single pole single throw, double pole single throw, three way, or four way as indicated on the drawings.

2.04 WALL DIMMERS

A. Manufacturers:
   5. Source Limitations: Furnish products produced by a single manufacturer and obtained from a single supplier. Dimmers shall be same manufacturer as Lighting Control Devices.
B. Wall Dimmers - General Requirements: Solid-state with continuous full-range even control following square law dimming curve, integral radio frequency interference filtering, power failure preset memory, air gap switch accessible without removing wall plate, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 1472; types and ratings suitable for load controlled as indicated on the drawings.
C. Provide accessory wall switches to match dimmer appearance when installed adjacent to each other.
2.05 RECEPTACLES
   A. Manufacturers:
   B. Receptacles - General Requirements: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498, and where applicable, FS W-C-596; types as indicated on the drawings.
      1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.
      2. NEMA configurations specified are according to NEMA WD 6.
   C. Convenience Receptacles:
      1. Standard Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R; single or duplex as indicated on the drawings.
   D. GFCI Receptacles:
      1. GFCI Receptacles - General Requirements: Self-testing, with feed-through protection and light to indicate ground fault tripped condition and loss of protection; listed as complying with UL 943, class A.
         a. Provide test and reset buttons of same color as device.

2.06 WALL PLATES
   A. Wall Plates: Comply with UL 514D.
      1. Configuration: One piece cover as required for quantity and types of corresponding wiring devices.
      3. Screws: Metal with slotted heads finished to match wall plate finish.
   B. Stainless Steel Wall Plates: Brushed satin finish, Type 302 stainless steel.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify that field measurements are as indicated.
   B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.
   C. Verify that wall openings are neatly cut and will be completely covered by wall plates.
   D. Verify that final surface finishes are complete, including painting.
   E. Verify that floor boxes are adjusted properly.
   F. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.
   G. Verify that openings in access floor are in proper locations.
   H. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION
   A. Provide extension rings to bring outlet boxes flush with finished surface.
   B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION
   A. Perform work in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.
B. Coordinate locations of outlet boxes provided under Section 260533.16 as required for installation of wiring devices provided under this section.
   1. Mounting Heights: Unless otherwise indicated, as follows:
      a. Wall Switches: 48 inches above finished floor.
      b. Wall Dimmers: 48 inches above finished floor.
      c. Receptacles: 18 inches above finished floor or 6 inches above counter.
   2. Orient outlet boxes for vertical installation of wiring devices unless otherwise indicated.
   3. Where multiple receptacles are installed at the same location and at the same mounting height, gang devices together under a common wall plate.
   4. Locate wall switches on strike side of door with edge of wall plate 3 inches from edge of door frame. Where locations are indicated otherwise, notify Engineer to obtain direction prior to proceeding with work.

C. Install wiring devices in accordance with manufacturer's instructions.

D. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

E. Where required, connect wiring devices using pigtailed not less than 6 inches long. Do not connect more than one conductor to wiring device terminals.

F. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.

G. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

H. Unless otherwise indicated, GFCI receptacles may be connected to provide feed-through protection to downstream devices. Label such devices to indicate they are protected by upstream GFCI protection.

I. Install wiring devices plumb and level with mounting yoke held rigidly in place.

J. Install wall switches with OFF position down.

K. Install wall dimmers to achieve full rating specified and indicated after derating for ganging as instructed by manufacturer.

L. Do not share neutral conductor on branch circuits utilizing wall dimmers.

M. Install vertically mounted receptacles with grounding pole on top and horizontally mounted receptacles with grounding pole on left.

N. Install wall plates to fit completely flush to wall with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.

O. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.

P. Identify wiring devices in accordance with Section 260553.

3.04 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for additional requirements.

B. Inspect each wiring device for damage and defects.

C. Operate each wall switch, wall dimmer, and fan speed controller with circuit energized to verify proper operation.

D. Test each receptacle to verify operation and proper polarity.

E. Test each GFCI receptacle for proper tripping operation according to manufacturer's instructions.

F. Correct wiring deficiencies and replace damaged or defective wiring devices.
3.05 ADJUSTING
   A. Adjust devices and wall plates to be flush and level.

3.06 CLEANING
   A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Interior luminaires.
B. Emergency lighting units.
C. Exit signs.

1.02 RELATED REQUIREMENTS

A. Section 260529 - Hangers and Supports for Electrical Systems.
B. Section 260533.16 - Boxes for Electrical Systems.

1.03 REFERENCE STANDARDS

F. NEMA LE 4 - Recessed Luminaires, Ceiling Compatibility 2012.
G. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, installed accessories, and ceiling compatibility; include model number nomenclature clearly marked with all proposed features.
1. LED Luminaires:
   a. Include estimated useful life, calculated based on IES LM-80 test data.
C. Operation and Maintenance Data: Instructions for each product including information on replacement parts.
D. Project Record Documents: Record actual connections and locations of luminaires and any associated remote components.

1.05 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.
1.06 WARRANTY
   A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
   B. Provide three year manufacturer warranty for LED luminaires, including drivers.

PART 2 PRODUCTS
2.01 LUMINAIRE TYPES
   A. Furnish products as indicated in luminaire schedule included on the drawings.
   B. Substitutions: See Section 016000 - Product Requirements.

2.02 LUMINARES
   A. Provide products that comply with requirements of NFPA 70.
   B. Provide products that are listed and labeled as complying with UL 1598, where applicable.
   C. Provide products listed, classified, and labeled as suitable for the purpose intended.
   D. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.
   E. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, supports, trims, accessories, etc. as necessary for a complete operating system.
   F. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.
   G. Recessed Luminaires:
   H. LED Luminaires:
      1. Components: UL 8750 recognized or listed as applicable.
      2. Tested in accordance with IES LM-79 and IES LM-80.
      3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.

2.03 EMERGENCY LIGHTING UNITS
   A. Description: Emergency lighting units complying with NFPA 101 and all applicable state and local codes, and listed and labeled as complying with UL 924.
   B. Operation: Upon interruption of normal power source or brownout condition exceeding 20 percent voltage drop from nominal, solid-state control automatically switches connected lamps to integral battery power for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.
   C. Battery:
      1. Size battery to supply all connected lamps, including emergency remote heads where indicated.
   D. Diagnostics: Provide power status indicator light and accessible integral test switch to manually activate emergency operation.
   E. Provide low-voltage disconnect to prevent battery damage from deep discharge.
   F. Self-Diagnostics: Provide units that self-monitor functionality and automatically perform testing required by NFPA 101 where indicated; provide indicator light(s) to report test and diagnostic status.
2.04 EXIT SIGNS
   A. Description: Exit signs complying with NFPA 101 and applicable state and local codes, and listed and labeled as complying with UL 924.
      1. Number of Faces: Single- or double-face as indicated or as required for installed location.
      2. Directional Arrows: As indicated or as required for installed location.
   B. Powered Exit Signs: Internally illuminated with LEDs unless otherwise indicated.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify that field measurements are as indicated.
   B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.
   C. Verify that suitable support frames are installed where required.
   D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.
   E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION
   A. Provide extension rings to bring outlet boxes flush with finished surface.
   B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION
   A. Coordinate locations of outlet boxes provided under Section 260533.16 as required for installation of luminaires provided under this section.
   B. Perform work in accordance with NECA 1 (general workmanship).
   C. Install products in accordance with manufacturer's instructions.
   D. Install luminaires securely, in a neat and workmanlike manner, as specified in NECA 500 (commercial lighting) and NECA 502 (industrial lighting).
   E. Provide required support and attachment in accordance with Section 260529.
   F. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.
   G. Suspended Ceiling Mounted Luminaires:
      1. Do not use ceiling tiles to bear weight of luminaires.
      2. Do not use ceiling support system to bear weight of luminaires unless ceiling support system is certified as suitable to do so.
      3. Secure lay-in luminaires to ceiling support channels using listed safety clips at four corners.
      4. See appropriate Division 9 section where suspended grid ceiling is specified for additional requirements.
   H. Install accessories furnished with each luminaire.
   I. Bond products and metal accessories to branch circuit equipment grounding conductor.
   J. Emergency Lighting Units:
      1. Unless otherwise indicated, connect unit to unswitched power from same circuit feeding normal lighting in same room or area. Bypass local switches, contactors, or other lighting controls.
   K. Exit Signs:
      1. Unless otherwise indicated, connect unit to unswitched power from same circuit feeding normal lighting in same room or area. Bypass local switches, contactors, or other lighting controls.
3.04 FIELD QUALITY CONTROL
   A. See Section 014000 - Quality Requirements, for additional requirements.
   B. Inspect each product for damage and defects.
   C. Operate each luminaire after installation and connection to verify proper operation.
   D. Test self-powered exit signs, emergency lighting units, and fluorescent emergency power supply units to verify proper operation upon loss of normal power supply.
   E. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Engineer.

3.05 ADJUSTING
   A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Engineer. Secure locking fittings in place.
   B. Aim and position adjustable emergency lighting unit lamps to achieve optimum illumination of egress path as required or as directed by Engineer or authority having jurisdiction.
   C. Exit Signs with Field-Selectable Directional Arrows: Set as indicated or as required to properly designate egress path as directed by Engineer or authority having jurisdiction.

3.06 CLEANING
   A. Clean surfaces according to NECA 500 (commercial lighting), NECA 502 (industrial lighting), and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

3.07 PROTECTION
   A. Protect installed luminaires from subsequent construction operations.

END OF SECTION
DES MOINES INDEPENDENT
COMMUNITY SCHOOL DISTRICT
LINCOLN SCIENCE & SPED CLASSROOMS UPGRADES

Updated: 11/24/2015

DESIGN CONSIDERATIONS

The issues addressed on the first three pages have been "trouble spots" during design and construction at most buildings. In some cases, these sections represent additional work for trades that do not normally read section 16740. These paragraphs SHALL be included in the proper section of the Specification Book and on the drawings. It is NOT intended that these directions to architects and engineers be included in the bid documents as a part of 16740.

Electrical.

QUAD OUTLETS REQUIRED  110V Quad Outlets are required for all staff and student computer workstations.

COMPUTER LAB LAYOUT  Layout of computer labs and other locations where there are multiple workstations is on a case-by-case basis and must be approved by DMPS Technology Department.

FLOOR BOXES  Floor boxes for 110VAC, Data or Voice are Prohibited. 16740 Paragraph 3.5 D 10+

ALL LOW VOLTAGE CABLE IN TRAY OR COMMON PATHWAY  All low voltage cable, except Fire Alarm, shall use the same pathways and sleeves up to the point where they go to their discrete device. Needs to be in HVAC section.

FIRE ALARM  Fire Alarm in separate pathway. If low voltage, do not put in conduit.

WORKMANSHIP  cables shall run parallel to or at right angles to building structure. Put in 16050

SINGLE GANG PLASTER RINGS AND 4 x 4 SQUARE BOXES  Single gang plaster rings for all data locations and 4 x 4 Square boxes for and teacher and student locations shall be provided. Put in 16050.

CORRIDOR BELLS  Prohibited. Demo existing.

WALL MOUNTED TELEVISIONS  are Prohibited. Demo existing and all associated cables, raceway, outlets etc.

HALLWAY CLOCKS  Wherever possible, mount hallway clocks on end walls. Coordinate clock locations with owner. Use of hanging clocks in halls must be approved on a case-by-case basis by the Owner.

USE OF ANY DEVICE IN THE 2.4 GHZ RANGE PROHIBITED  Para 3.5A 18. Interferes with the District Wireless.

The following paragraphs are for the general piping section of the Mechanical spec. This information needs to also be on construction drawings. "Clouds" shall be placed around Telecommunication Rooms with appropriate notes prohibiting pipes. Clouds shall also be placed on floors above the Telecommunications Rooms if there are vertical sleeves or any method for water to migrate from the floor above.

PIPES AND DUCTWORK ABOVE OR IN TELECOMMUNICATIONS ROOM ARE PROHIBITED – The Main Telecommunications Room, Main Distribution Frame (MDF), Intermediate Telecommunications Rooms shall be free from ductwork, HVAC, plumbing and electrical utilities not directly supporting the telecommunications equipment, and in no instance, shall it be located in the boiler room or in any other area susceptible to damage caused by leaks. No pipes of any kind (water lines, steam, sewer, hydronic, air conditioning etc.) shall be allowed in or above the Telecommunications Rooms. Telecommunications rooms shall not to be used as a route for other facilities to "pass through". The location of the Telecommunication Room shall take into account the services located on floors above the room, and shall not be located under restrooms, locker rooms, service lockers or other areas where leaks could occur. 16740 3.6A4

PIPES THROUGH CABLE TRAYS  Pipes and ducts shall not run through or interfere with cable trays. Coordinate with other trades.

NO SPRINKLER PIPES IN DATA ROOM. Sprinkler system supply pipes are prohibited in or above all Telecommunications Rooms. Routing shall be designed and installed so that the absolute minimum amount of pipe is in Telecommunications rooms. Only one wall mounted head, typically located above the door, shall be used unless more are required by code.
The following paragraph is for the sprinkler specification. Also place note to this effect on the sprinkler drawings.

**HEAD TEMPERATURE.** The discharge temperature of the head in all data rooms shall be 286 degrees.

The following paragraph is for the elevator specification.

**ELEVATOR PHONE**  
The elevator contractor shall provide and program the elevator phone.

The following paragraphs are for the Civil sheets and the Mechanical and Electrical site sheets if any outside work is shown.

**CROSSING EXISTING BURIED TELECOMMUNICATIONS LINES**  
Put in Civil, M and E sections where outside work is shown or could possibly be added during construction: When crossing existing telecommunications cables, the contractor shall verify the location and depth by manually potholing the existing cables.

**UTILITY WARNING ON ALL PLAN PAGES (CIVIL, M & E) SHOWING OUTSIDE WORK**  
There are many buried utilities on the property that are District Owned facilities and are not on the One Call system. The following warning statement shall be included on all Civil drawings and any Mechanical or Electrical drawings where underground work is shown. Please see Section 16740, Paragraph 3.3 A 1 for detailed information and 16740, Figure 2 for Excavation Permit.

**WARNING - CALL 48 HOURS BEFORE YOU DIG**  
There are underground utilities that are owned by Des Moines Schools. They will NOT be located by Iowa One Call.

Iowa law REQUIRES anyone doing any excavation, fencing, planting, or drilling to call 48 hours in advance. Hand dig within 18 inches of any locate mark or flag. Des Moines Schools Excavation Permit is REQUIRED.

Call: Des Moines Schools 515 242 7700
Iowa One Call 1 800 292 8989

For Mechanical, Electrical and Civil Section  
Place note on the construction drawings. Getting these tracer wires installed has been an ONGOING problem. I would be greatly obliged if it were prominently stated in both the mechanical section, civil section, and the construction drawings.

**TRACER WIRE PLACEMENT AND TERMINATION** - Need General Note clearly defining that the site contractor will terminate and be responsible for the condition of the tracer wires. This is always an argument during construction. The site contractor says he is only responsible up to 5 feet from the building. The mechanical says he didn’t put them in. Please solve this on the drawing and in the spec book with the following:

**TRACER WIRES REQUIRED ON ALL EXTERIOR UNDERGROUND SERVICES** - Tracer wires shall be provided for all exterior underground services, including Sanitary Sewer, Storm Sewer, Water, Hydronic, Power, Telecommunications, Control Cables and Camera lines. The site contractor and the hydronic system contractor shall install and be responsible for all tracer wires on underground services installed by their company. The installing contractor shall take the tracer wire all the way to the building and shall terminate it on the outside wall of the building per specification. See Section 16740, Paragraph 3.6A, Figures 11 and 13 for detailed information.

The following paragraph is for the general architectural specifications.

Data room construction and finishes.

**TELECOMMUNICATIONS CABLES, RACEWAY AND DEVICES SHALL NOT BE PAINTED**

1. **DO NOT PAINT CABLES** - 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, raceway or devices is not acceptable.

4. **NOTIFICATION** - It shall be the responsibility of the Contractor to notify DMPS Project Manager and the Des Moines Schools Technology Department if any cable is painted. Such notification shall be made within one working day of the occurrence, so that representative of the Technology Department of the Des Moines Schools can make assessment of the damage.

See 16740, Paragraph 3.13 A. Place this prohibition in the “paint” section 9900.

**MAIN TELECOM ROOM WALL, CEILING AND FLOOR TREATMENT**

The floor shall be Vinyl Composition Tile (VCT), white or very light in color. Walls shall be sealed to the ceiling structure to prevent dirt infiltration. All walls of the room shall be finished with 3/4” thick grade A/C plywood which will serve as the backboard for the main distribution frame (MDF). The 4 x 8 plywood sheets shall be mounted vertically with the bottom of the board resting on the floor. It shall be securely anchored to the wall. Plywood shall be mounted in such a manner and the wall shall be constructed in such a manner that it will support a Telephone System Unit weighing approximately 40 pounds, and at least 40 additional pounds of auxiliary equipment and cable. Sheetrock above the plywood shall be taped but not sanded inside the room. All walls and ceiling shall be painted white semi-gloss enamel. Cable Tray shall be mounted above or at the top of the plywood on all sides of the room. There shall be no accessible ceiling in the room, unless required to prevent dirt infiltration. Please see section 16740, 3.5 B for detailed information about the District Standard for these rooms. Conduit to roof. 3-inch. To highest part of the roof for clock transmitter/receiver coax.

**PLYWOOD FOR INTERMEDIATE TELECOMMUNICATIONS ROOM**

Install a single sheet of plywood, horizontally, with the bottom 36 inches AFF. All other requirements same as Main Telecom Room. Please see section 16740, 3.5 B and C for detailed information.

**ROOM NUMBERS.** Put the “real” room numbers on the construction drawings. DO NOT USE construction numbers or any other numbers on the drawings other than the “real” room numbers. Coordinate the room numbering with the Owner.

**EARLY COMPLETION OF TELECOMMUNICATIONS ROOM.** - The Telecommunication Room shall be completed very early in the project, and prior to beginning installation of any HVAC, Clock, Security or Telecommunications equipment or cabling. Please see Section 16740, Paragraph 1.9 for detailed information. This needs to be in the General Instructions for the Contractor.

**TELECOMMUNICATIONS ROOM DOOR**

Solid door with no window, no smaller than 36x80. Section 12.2.5

**TELECOMMUNICATIONS ROOM ACCESS**

The Telecommunications Rooms shall be accessible directly from hallways or common areas of the building.

**MEDECO CYLINDERS**

All Telecommunications Rooms, or other rooms containing Telecommunications distribution points shall be keyed with MEDECO brand cylinders. Should there be any other doors between the Telecom Rooms and the outside door controlled by the card reader, MEDECO cylinders shall also be placed on those doors. Coordinate with District Locksmith.

**SIGNAGE FOR TELECOM ROOMS**

NONE. Telecommunications Rooms shall not be identified in any way. If required by code, use room number only.

**NO CABLING WITHIN 6 INCHES OF ROOF DECK** - this applies to all types of wiring. Fire Alarm, Security, HVAC Control, data, voice, PA and everything else. This must be on the drawings and in the specs for each of the trades involved.
DD Checklist

ARCHITECTURAL
Site Work 02050

Site drawing has all info available.

**WARNING - CALL 48 HOURS BEFORE YOU DIG**
There are underground utilities that are owned by Des Moines Schools. They will NOT be located by Iowa One Call. Iowa law REQUIRES anyone doing any excavation, fencing, planting, or drilling to call 48 hours in advance. Hand dig within 18 inches of any locate mark or flag. Des Moines Schools Excavation Permit is REQUIRED. Call: Des Moines Schools 515 242 7700 242 7700 Iowa One Call 1 800 292 8989

CROSSING EXISTING BURIED TELECOMMUNICATIONS LINES When crossing existing telecommunications cables, the contractor shall verify the location and depth by manually potholing the existing cables. Needs to be in all UG sections.

Manholes as needed

Double 6” cleanouts. Since 6-inch double cleanouts are not manufactured, a double cleanout will need to be specified using 6-inch wye’s and 45 degree elbows positioned in such a way that the area between the wye’s can be cleaned from both access points. Use metal cap with recessed for access. Concrete pad at grade around the cleanout access points.

**9900 TELECOMMUNICATIONS CABLES AND RACEWAY SHALL NOT BE PAINTED** See 16740, Paragraph 3.13 A. Place this prohibition in the “paint” section 9900.

**TELECOM ROOM FINISH** See 16740 Paragraph 3.5A+

**Section 13811**
This will be standarized sections provided by Des Moines Schools through DMPS Project Manager. They are to be used intact without renumbering or modification.

**Sprinkler 13915** Head Temperature 286 degrees.

**NO SPRINKLER PIPES IN DATA ROOM.** Sprinkler system supply pipes are prohibited in or above all Telecommunications Rooms. Routing shall be designed and installed so that the absolute minimum amount of pipe is in Telecommunications rooms. Only one wall mounted head shall be used unless more are required by code. PUT THIS IN THE SPRINKLER SECTION!!

**Elevator Phone 14240**
Check to see elevator equipment room phone is on the plan sheets

**ELEVATOR PHONE** The elevator contractor shall provide and program the elevator phone.

**MECHANICAL & ELECTRICAL**

**TRACER WIRES REQUIRED ON ALL EXTERIOR UNDERGROUND SERVICES** Tracer wires shall be provided for all exterior underground services, including Sanitary Sewer, Storm Sewer, Water, Hydronic, Power, Telecommunications, Control Cables and Camera lines. Please see Section 16740, Paragraph 3.6A, Figures 11 and 13 for detailed information.
Section 15160 - Storm Drainage Piping
See information about tracer wires and pipe routing above.

Section 15181 Hydronic Piping
See information about tracer wires and pipe routing above.

NO PIPES THROUGH CABLE TRAYS  Pipes and ductwork shall not run through or interfere with cable trays. Coordinate with other trades. Pipes that are installed through cable shall be moved. This must be on the drawings and in the spec section for the plumber and sprinkler contractors.

TELECOM ROOMS
Conduit to roof. 3-inch. To highest part of the roof. Clock Transmitter conduit
Room Finish see above
Telecom conduits and vault
Telecom Ground bar, conduits to other floors,
Speaker in telecom room.
Cable tray around the room

Clouds around telecom room
No pipes of any kind (water lines, steam, sewer, hydronic, air conditioning etc.) shall be allowed in or above the Telecommunications Rooms. Telecommunications rooms shall not to be used as a route for ducts or other facilities to "pass through".

Miscellaneous
Daylight for clock antenna.
Thermostat location do not locate so that it short cycles.
Please locate it at 60 inches AFF in the warm corner.
Election Phone if needed
Stair speakers.
Outside Bells Shown

TELECOM ROOMS -- Dedicated heat pump. Cooling 24/7/365

GYM Local PA protect, install conduits and cable

OFFICE
Wireless access points.
Floater Phone in the office.
Speakers in Principle, Vice Principle, Nurse, and office in the corners. Voice and data outlet for copy machine.

LIBRARY
CATV in commons, library, back room, and offices
Computer stations

KITCHEN
Check point of sale location. (CAT6 data connection)
Des Moines Public Schools
Standard Telecommunications Specifications

SECTION 16740
TELECOMMUNICATIONS SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

A. SECTION INCLUDES

1. SPECIFICATIONS
   a. This Section applies to all classrooms, administrative or support staff workstations, all common areas and all service areas of the building.
   b. It establishes the general specifications for a premise distribution system that will support all industry standards compliant applications and allow multi-vendor compatibility on shared media to meet the voice, data, PA, and CATV needs of the Owner.
   c. The data system shall consist of horizontal copper cables, fiber optic backbone cabling, jacks, patch panels and equipment racks.
   d. Voice service to each station shall be provided over Category 6 cabling and jacks.
   e. The PA (ADDRESSABLE FIRE-ALARM SYSTEM) system shall consist of installation of speakers, speaker tapping, speaker cabling and termination by Contractor. The owner will install the PA common equipment.
   f. The CATV system shall consist of installation and termination of Coaxial cable.
   g. Installation and testing of all components.
   h. The requirements stated herein are for all work indicated on the drawings and required under this specification.

2. COMMON PATHWAY All low voltage cable, except fire alarm, shall be installed in the same pathway.

B. PA SYSTEM COMMON EQUIPMENT PRODUCTS FURNISHED AND INSTALLED BY OWNER

1. Bogen CPU, TIM and ZPM module

C. PA SYSTEM COMPONENTS TO BE PROVIDED BY CONTRACTOR PER APPROVED MATERIALS LIST

1. All speakers per plan.
2. All speaker cabling.
3. Marking of speaker cabling per this specification.
4. Speaker tapping per this specification.
5. Terminations of all cables in Addressable Fire Alarm Panel
6. Termination of all feeder cables between the MDF and IDFs.
7. Microphone Jack, Cannon XLR 3 Pin, cabling and termination of both ends. (See wiring diagram Figure 8)
8. Music Input Jack, cabling and termination of both ends.
9. Wire Speaker Guards (if noted on plan).
10. Connection between owner provided PA modules and the Addressable Fire alarm Panel

D. CONTRACTOR SHALL PROVIDE ALL OTHER EQUIPMENT PER APPROVED MATERIAL LIST

1. The Contractor shall supply and install the components per the Approved Materials List and this specification.
2. Provide all other materials, equipment, phones, cable, connectors, hardware, mounting brackets, spacers, ground lugs etc. which will result in a complete, viable telecommunications systems, whether mentioned in this specification or not.

E. RELATED SECTIONS

1. Wireless Clock Peripheral Device Installation
2. 13811, Wireless Clock Mounting
1.2 REFERENCES

A. ALL WORK SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH THE LATEST VERSION OF THE FOLLOWING BUILDING CODES AND STANDARDS:
   1. ANSI/EIA/TIA 568 Commercial Building Telecommunications Wiring Standard
   2. TIA/EIA/TSB 67 Transmission Performance Specifications for Field Testing of UTP Cabling Systems
   3. ANSI/EIA/TIA 569A Commercial Building Standard for Telecommunications Pathways and Spaces
   4. ANSI/EIA/TIA 570 Residential and Light Commercial Telecommunications Wiring Standard
   5. ANSI/TIA/EIA 606 Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
   6. TIA/EIA J STD 607 A Commercial Building Grounding and Bonding Requirements for Telecommunications
   7. ANSI/TIA 942 Telecommunications Infrastructure Standards
   9. NEBS Level 3 Minimum Level of Environmental Compatibility for Maximum Reliability
   10. UL 467 and 468A Grounding and Bonding
   11. ISO/IEC 11801 Generic Cabling for Customer Premises
   12. BICSI TDMM (added by KRHO)

B. INSTALLATION PRACTICE TO BE FOLLOWED:
   1. COPPER COMPONENTS
      a. Category 6 performance requirements per ANSI/TIA/EIA 568-B.2-3
      b. Category 6A performance requirements ANSI/TIA/EIA 568 B.2 10
   2. FIBER OPTIC COMPONENTS Performance requirements per EIA/TIA 568B.3.
   3. SAFETY STANDARD
      a. NEC 770/UL OFNR/OFNP
      b. All applicable local state and national codes.
   4. MATERIALS STANDARD
      a. Bellcore TR NWT 000409
      b. ICEA 83 596
   5. GROUNDING
      a. TIA/EIA J STD 607A
   6. ALL MANUFACTURER’S PRACTICES

C. METHODOLOGIES outlined in the latest edition of the BICSI Telecommunications Distribution Methods Manual shall also be used during all installation activities. Should conflicts exist with the foregoing, the authority having jurisdiction of enforcement will have responsibility for making interpretation.

1.3 DEFINITIONS

A. MDF Main Distribution Frame Wall or rack mounted distribution point that provides data, voice, CATV and PA service to the entire building, either directly or through sub distribution points in other parts of the building.

B. MAIN TELECOMMUNICATIONS ROOM Room which contains the MDF and the following main service panels:
   1. ADDRESSABLE FIRE ALARM CONTROL PANEL
   2. HVAC CONTROL PANEL
   3. CARD READER CONTROLLER
   4. SECURITY CONTROL PANEL
   5. PUBLIC ADDRESS SYSTEM COMPONENTS
   6. DATA NETWORK SYSTEM

C. INTERMEDIATE TELECOMMUNICATIONS ROOM Room which contains an IDF and may contain intermediate feed points for voice, data, CATV and other services.

D. IDF Intermediate Distribution Frame Wall or rack mounted distribution point that is fed from the MDF and provides data, voice, CATV and other service to a portion of a building.
E. DATA ONLY IDF  Intermediate Distribution Frame  Wall mounted cabinet that is fed from the MDF or a full service IDF and provides ONLY data service to specific locations called out on the drawings.

1.4 SYSTEM DESCRIPTION

A. PROJECT REQUIREMENTS

1. TELECOMMUNICATIONS ROOMS
   a. The Telecommunications Rooms and IDFs shall be laid out in a manner suitable to installation of the voice/data/PA/CATV system.
   b. Coordinate layout with Owner prior to beginning installation of any electrical rough in, equipment, conduit, grounds, cable support systems or panels.
   c. No equipment shall be mounted in any Telecommunications Room without the express approval of the Owner.
   d. Telecommunications rooms shall be clean and secure prior to any cabling or equipment being installed.

2. SIZING FOR VOICE FEEDER CABLE
   a. Feeder cable sizing will be specified by the owner.

B. PERFORMANCE REQUIREMENTS

1. PROVIDE AND TEST. The installer shall provide and test all materials necessary to install copper and fiber optic cable, including termination from each work area jack to the MDF or IDF per plan.

1.5 SUBMITTALS

A. SUBMITTAL FORM AND PRODUCT DATA

1. Contractors are required to complete the Submittal Form, Figure 14 in this Section.
2. DO NOT submit product data unless specifically requested.
3. Submittals that do not contain the required certifications for voice, data and PA will be rejected.

B. SHOP DRAWINGS

1. CABLING PLAN REQUIRED  Prior to installation of any data cabling, the Contractor shall submit a cabling plan for review and approval. This plan shall show the MDF and all IDFs. It shall indicate which voice/data outlets shall be served from each. This plan shall also identify any locations that appear to be beyond the footage limitation.
2. PATHWAY PLAN  Before beginning installation of cable pathways, the Contractor shall provide the Owner and Engineer with drawings showing the pathway routing and size. The pathway plan shall be approved in writing by the Owner before beginning installation.
3. PROTECTION PLAN. Services to the Telecommunications Rooms are of a critical nature.
   a. Submit a Protection Plan to the Engineer, Owner, and the District.
   b. Detail security, access, and demolition plans.
   c. Detail how construction will proceed without interruptions of electrical service or of existing Telecommunications cables.
   d. Submit prior to the beginning of any demolition or construction activity
   e. Contractor, Engineer, Owner, and the District shall meet for the purpose of discussing the plan.
   f. No demolition shall take place until the plan has been approved in writing by the Engineer, Owner, and the District.
   g. Should the Contractor deviate from the plan, and cause any type of interruption or damage, they shall be liable for all costs in the process of recovering from the interruption or damage, as detailed in Section 3.7.

C. QUALITY ASSURANCE/CONTROL SUBMITTALS

1. Submission of a properly completed Submittal Form as shown in Figure 14.
2. All documentation required by Figure 14.

D. CLOSEOUT SUBMITTALS

1. AS BUILT DRAWINGS. The Contractor shall provide as built drawing, showing each technology outlet, the number assigned and the Telecommunications Room or distribution point from which they are served and the cable routing from the MDF or IDF.
2. **PA SYSTEM INFORMATION.** Provide a drawing showing how the PA system speakers are wired. If any speakers are looped, the speakers looped together shall be noted. The routing of all cables shall be shown.

3. **EQUIPMENT MANUALS.** Include all equipment manuals unless instructed to provide them directly to the Technology Department of the Des Moines Schools.

### 1.6 QUALITY ASSURANCE

#### A. QUALIFICATIONS FOR DATA AND VOICE INSTALLATION AND PA CABLE TERMINATION

1. **COMPANY QUALIFICATIONS**
   
   a. At least 5 years’ experience installing telecommunications systems.
   
   b. Provide six (6) references for projects of similar scope and specifications.
   
   c. Provide manufacturer’s certification of Contractor per Figure 14
   
   d. Contractor shall not be allowed on site unless approved in writing by Engineer and the Owner.
   
   e. E-Rate Certified and provide up to date Service Provider Identification Number (SPIN)

2. **INSTALLATION PERSONNEL**
   
   a. All installation personnel shall be factory certified on all products installed.
   
   b. Submit proof of attendance and successful completion of an approved installation course.
   
   c. All employees performing the installation must be certified by one of the methods listed below.
   
   d. Report any modifications to the work crew approved in submittals or identified to the Owner.
   
   e. Provide certificates prior to that individual beginning work on site.

3. **FOREMAN**
   
   a. Identify the foreman for Telecommunications work by name prior to beginning work.
   
   b. Provide proof of successful completion of “Data/voice Foreman” course from those listed below.
   
   c. Named foreman shall be on site whenever any work is being performed.
   
   d. The foreman shall not be changed during the course of the project unless they leave the employment of the company.

4. **PROOF OF ATTENDANCE**
   
   a. Submit copies of training certificates per Figure 14 of this Section.
   
   b. Submit certificate for Foreman and each person performing installation.

#### B. APPROVED CERTIFICATIONS FOR DATA, VOICE AND PA SYSTEM CABLE TERMINATION

1. **APPROVED COURSES AND MANUFACTURERS.** Course for on-site Construction Foreman and each member of the on-site installation crew shall be the following courses or prior approved equivalent.
   
   a. Factory Certification is required of the Company performing installation of any Data, Voice, PA components by one of the following companies:
      
      1) Panduit
      2) Ortronics
      3) Systimax
      4) Siemon
      5) Belden
      
      7) NICET Level III for Audio Systems (PA Cable termination only)
   
   b. Data/voice/PA Installation Foreman: Individual certified by one of the following:
      
      1) Systimax ND 3321 PDS Design & Engineering
      2) Systimax ND 3341 PDS Installation & Maintenance
      3) Ortronics Installation Supervisor Training
      4) BICSI Installation Supervisor Training
      5) Siemon Installation Supervisor Training
      6) NICET Level III for Audio Systems (PA Cable termination only)
   
   c. Data/voice/PA Installation Personnel. ALL MEMBERS CERTIFIED by any one of the following:
      
      1) Panduit Factory Certification
      2) Ortronics Factory Certification
      3) BICSI Installer Level 1
      4) Siemon Installer Training
      5) NICET Level III for Audio Systems (PA Cable termination only)

2. **APPROVED INSTALLERS FOR PA SYSTEM TERMINATION**

   The following installing companies have submitted proper certification, as required above, to the Owner. Other companies wishing to bid PA System Termination must submit proof of certification to the Owner a
minimum of 7 days prior to bid day and be approved. Failure to submit proof of certification as indicated will disqualify them. Approved Installers are:

a. ABC Electric
   5299 NE 15th St.
   Des Moines, IA 50313
b. Baker Electric
   111 Jackson
   Des Moines, IA 50315
c. Communications Engineering Company
   405 Boyson Road
   Hiawatha, IA 52233
d. Communications Innovators
   1301 NE 56th St
   Pleasant Hill, IA 50327
e. Rankin Communications Systems
   5444 NW 96th St.
   Johnston, IA 50131
f. Tri City Electric Co.
g. 11241 Aurora Ave. Bldg. 6
   Urbandale, IA 50322
h. Van Maanen Technology
   629 N. 19th Ave. E.
   Newton, IA 50208
i. SCI Communications
   2001 E Army Post Road
   Suite B
   Des Moines, IA 50320

C. REGULATORY REQUIREMENTS
   1. National Electrical Code 2012
   2. NFPA 70

D. COORDINATION OF INSTALLATION
   1. COORDINATION. Installations shall be coordinated with the Technology Department of the District.
   2. PRE-CONSTRUCTION MEETING. The General Contractor, the Electrical subcontractor and the Communications Wiring subcontractor shall attend a meeting with DMPS Technology Department prior to the beginning of any construction activities.
   3. PRE-INSTALLATION MEETING. The General Contractor, the Electrical subcontractor and all Communications subcontractors shall attend a meeting with the district Technology Department prior to the beginning of telecommunications installations.

E. REMOVAL OF PERSONNEL. The Owner shall have the right to request removal from the job an employee of any Contractor or subcontractor. Such a request will be made in consultation with the Owner and shall not be made without good cause. Should such a request be made, the Contractor shall immediately and permanently remove that individual from the job.

1.7 DELIVERY, STORAGE, AND HANDLING

A. STORAGE AND PROTECTION
   1. MATERIALS All Materials shall be stored in such a manner that they will be in factory new condition when installed.
   2. CLEAN ENVIRONMENT After installation all active components and equipment shall be protected from dust, dirt, overspray and other construction hazards so that when the owner takes possession of the building they are clean and in new condition.

1.8 PROJECT/SITE CONDITIONS

A. ENVIRONMENTAL REQUIREMENTS
   1. CLEAN ROOMS. During construction, Telecommunications Rooms and all materials and equipment installed within shall be kept clean, dry, and free of dirt, dust, and paint overspray.
2. TEMPORARY SERVICES. Temporary heat and cooling shall be supplied during construction to keep active telecommunications rooms between 55- and 80-degrees F. 24 hours a day, 7 days a week. If necessary, the Contractor shall build temporary walls, dust barriers, ceilings, or water barriers to prevent damage to equipment.

B. EXISTING CONDITIONS
1. REMOVE OLD UNUSED CABLE. Per NEC 2012, the Contractor shall remove all exposed old cable unless the Owner identifies the cable for future use.
2. EXTERIOR CABLE
   a. The Contractor shall remove any unused cable, wire, or conduit from the exterior walls of the building.
   b. The Contractor shall restore or repair the locations where conduit or cable was attached.
   c. There shall be no exposed exterior Telecommunications cables.
   d. If exterior cables are above grade, they shall be neatly dressed and covered or placed in conduit or U Guard.
   e. Coordinate with the architect and the Owner.
3. SCHOOL DISTRICT ACCESS DURING CONSTRUCTION. The Contractor is required to provide timely access 24 hours per day, 7 days a week to DMPS Telecommunications Technicians.
4. CONTRACTOR ACCESS TO ACTIVE TELECOMMUNICATIONS ROOMS. All work in active Telecommunications Room shall be coordinated with the Owner. The Contractor will be provided with a procedure and 24/7 telephone number to call for admittance to the Telecommunications Room. The room will then be remotely unlocked for the hours that the Contractor will be in the room. Contractors shall not be issued keys. The room shall be kept clean and secure during construction. Coordinate with the Owner prior to beginning work in the Telecommunications Room.

1.9 SEQUENCING
A. EARLY COMPLETION OF TELECOMMUNICATIONS ROOMS. The Telecommunication Room(s) shall be completed very early in the project.
   1. WORK COMPLETE. Walls, floor, conduit, cable tray, penetrations, duct work, painting and all finish work shall be completed, and the room shall be clean before beginning installation of any components in the Telecommunication Room.
   2. READY FOR INSTALLATION. The determination of readiness for installation shall be made by agreement of the Architect, Engineer, Contractor, Owner, and the District.
   3. NO EARLY MOBILIZATION. Nothing in this paragraph shall be interpreted to cause an early mobilization of any Contractor or trade. Rather, as Contractors and trades appear on site, they shall complete their work in the Telecommunications Rooms as soon as possible.
4. INSTALLATION CAN BEGIN ONLY AFTER ROOM IS READY - No equipment or cabling shall be installed until the room is ready. This includes all cable and equipment to be installed in the telecommunications room, no matter what the application, or which Contractor or subcontractor is installing. Equipment and cable installed before the room is ready may, at the discretion of the District, be deemed to be damaged and shall be replaced at the Contractor's cost.

B. PERMANENT POWER TO TELECOMMUNICATIONS ROOMS. Install permanent power to the Telecommunications Rooms as soon as possible to further prevent power interruptions.

C. TEMPORARY POWER, VOICE, DATA, AND PA CONNECTIONS The Contractor shall provide temporary power to the main data room and intermediate data rooms as needed.

1.10 WARRANTY
A. 25 YEAR WARRANTY REQUIRED. The installing vendor shall provide a Manufacturer’s Warranty for a period of at least twenty-five (25) years on the Data Cabling System, certifying that the system will support all the applications that it was designed to support as specified. Warranty shall cover the data cabling system, labeling and certification that all wiring outlet jacks, patch panels, terminations, etc., have been properly installed, identified, labeled and documentation is complete. When the project is complete, mail the test results and warranty documents to the DMPS Telecom Manager.

B. EXTENDED LABOR WARRANTY – Twenty-Five (25) year extended labor warranty for the replacement of any data cabling component found to be defective.
C. WARRANTY CERTIFICATE. Upon completion, and before final acceptance, the Contractor shall file the warranty certificate with the Owner.

D. ONE YEAR WARRANTY. A warranty period of ONE YEAR shall be required on all components not listed in Paragraphs A and B above. The Warranty Period starts upon acceptance, in writing, by the district.

1.11 ALL SYSTEMS OPERATIONAL TWO WEEKS PRIOR TO TURNOVER.

A. ALL SYSTEMS All PA speakers, Clock System, Voice and Data systems shall be operational and available for owner testing two weeks prior to scheduled turnover of the building.

1.12 OWNER'S INSTRUCTION - The Contractor shall meet with the Owner’s representatives and show them all major cable pathways and risers.

1.13 COMMISSIONING

A. COMPLETION OF PROJECT. Project will not be considered complete until Contractor has completed the following tasks:
   1. TESTING. All testing has been completed, testing results have been submitted to the Owner, and the installer has certified that the installation meets all specified tolerances.
   2. LABELING. All locations have been labeled on the faceplate and the patch panel in accordance to labeling requirements as specified. Labeling shall include closet locations and jack locations.
   3. CLEAN UP. All ceiling tiles, where applicable, that may have been removed by the installer have been replaced and cleanup of debris created during the installation process has been finished.
   4. RECORD DRAWINGS. Provide record drawings that includes; as built information, cable routing, jack locations, and telecommunication room layouts. Jack locations shall be identified by their sequential number as defined elsewhere in this document. Numbering, icons and drawing conventions used shall be consistent throughout all documentation provided.
   5. DOCUMENTATION. All documentation and drawings have been submitted.

PART 2 PRODUCTS

2.1 MANUFACTURERS - Acceptable manufacturers are listed in the Approved Materials List in this specification. Any “Or Equal” shall need to be approved by District Technology Approved Agent. Suppliers seeking non listed products for approval, shall submit substitution request per section 01630.

2.2 EXISTING PRODUCTS. None.

2.3 MATERIALS

A. APPROVED MATERIALS LIST Contractor shall use material listed in the Approved Materials List in this specification. Any “Or Equal” shall need to be approved by District Technology Agent.

B. ALL NEW MATERIALS – All materials must be new. Materials that have been previously installed, or are salvage are not acceptable.

2.4 MANUFACTURED UNITS. None

2.5 EQUIPMENT AND MATERIALS

A. APPROVED MATERIALS LIST The Des Moines Schools has a sizeable installed base of technology infrastructure. For consistency between buildings, the following materials and equipment shall be used. Contractors shall choose materials from this list. All items shall be provided exactly as described. Any “Or Equal” or exceptions shall be approved by District Technology Construction Agent.
<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>MANUFACTURER</th>
<th>PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telephone, Analog, Desk</td>
<td>Cortelco</td>
<td>2500 44 VBA 20M Color Ash (44)</td>
</tr>
<tr>
<td>Button Remote Passing Tone/Bells</td>
<td>Edwards</td>
<td>821</td>
</tr>
<tr>
<td>Mounting Plate for Edwards 821</td>
<td>Edwards</td>
<td>149 1</td>
</tr>
<tr>
<td>Mini Elevator Speakerphone with automatic dialer (Provided/programmed by</td>
<td>Viking Electronics</td>
<td>E 1600A</td>
</tr>
<tr>
<td>elevator contractor)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency Phone used in “Place of Refuge”</td>
<td>Viking Electronics</td>
<td>E 1600 02A Recessed in wall</td>
</tr>
<tr>
<td>Grade Level Buried Cable Enclosure, less lid. Bolt two units together</td>
<td>PenCell</td>
<td>PE 30 GS TWO (2) REQUIRED</td>
</tr>
<tr>
<td>Steel Lid 3/16 Diamond Plate. Hot dipped Galvanized, Hex Head Bolts.</td>
<td>PenCell</td>
<td>PE 30 SL H ONE (1) REQUIRED</td>
</tr>
<tr>
<td>2-inch spacer for 17x30 top of PE 30. Specify for use with Steel Lid.</td>
<td>PenCell</td>
<td>PE 30 2 Use only with written permission of owner to</td>
</tr>
<tr>
<td>Fabric Innerduct 3 Cell with pull string in each cell for installation</td>
<td>MAXCELL</td>
<td>MaxLube spray MXC 35LR, wipe MXC D20</td>
</tr>
<tr>
<td>in entry conduits; 3 Inch, 3 Cell with pull ropes installed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lubricant for use with Maxcell innerduct above</td>
<td>MAXCELL</td>
<td>MXC3456 CUT REEL</td>
</tr>
<tr>
<td>Ground Rod for Tracer Wire Only</td>
<td>Erico Harger</td>
<td>6138529</td>
</tr>
<tr>
<td>Clamp ½” Ground Rod for Tracer wire</td>
<td>Burndy GRC12</td>
<td>588</td>
</tr>
<tr>
<td>Terminal Block Tracer Wire Two terminals</td>
<td>Emerson Network Power (formerly Reliant)</td>
<td>5533</td>
</tr>
<tr>
<td>Tracer Wire Copper #12, PE insulation for direct burial, any color.</td>
<td>Kris Tech Cable</td>
<td>1201PE45XX (allow lead time to order)</td>
</tr>
<tr>
<td>Splices not allowed.</td>
<td>Allentel</td>
<td>XLP USE 12 STR any color</td>
</tr>
<tr>
<td>Label kit for tracer wire</td>
<td>Panduit</td>
<td>PST FO (Pack of 5)</td>
</tr>
<tr>
<td>Small Handhole for Tracer 12x12x12</td>
<td>Quazite/Hubbell/Lenoir</td>
<td>Body PC1212BA12 CoverPC1212CA00</td>
</tr>
<tr>
<td>Underground Warning Tape Proper color for utility being marked.</td>
<td>Panduit Brady</td>
<td>HTDU60-*(FO, T, E) B 720 Identoline Series</td>
</tr>
<tr>
<td>Epoxy Splice Kit To be used ONLY if approved By owner on a case-by-case</td>
<td>Scotch Burndy</td>
<td>3832</td>
</tr>
<tr>
<td>basis.</td>
<td></td>
<td>Kearney Nut KS17 (not included in kit)</td>
</tr>
<tr>
<td>Conduit, Sleeves and Building Entrance, 4-inch,</td>
<td>Schedule 40 PVC 4</td>
<td></td>
</tr>
<tr>
<td>Conduit Plug, 4-inch Blank</td>
<td>Jackmoon JMBLA40D402U</td>
<td>(Multiple plugs required)</td>
</tr>
<tr>
<td>Flexible Conduit innerduct for directional bore</td>
<td>Dura Line/Amco</td>
<td>7 170312 2500</td>
</tr>
<tr>
<td>Schedule 80 Innerduct 2 inch with pull tape</td>
<td>HDPE</td>
<td>7 170213 0550</td>
</tr>
<tr>
<td>Schedule 80 Innerduct 4 inch with pull tape</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 Pair Lightning Protector 66 in/out</td>
<td>Circa 2625QC/QC</td>
<td></td>
</tr>
<tr>
<td>Module Lightning Protector, Standard Gas tube</td>
<td>Circa 3B1E</td>
<td></td>
</tr>
<tr>
<td>66 Block Standard Split Block</td>
<td>Siemon M1 50</td>
<td></td>
</tr>
<tr>
<td>Standoff bracket for 66 Block</td>
<td>Siemon S89D</td>
<td></td>
</tr>
<tr>
<td>66 Block Split with one female 25 pair Connector</td>
<td>Siemon M150R</td>
<td></td>
</tr>
<tr>
<td>Spool to Support Cross Connect, White</td>
<td>Siemon S20B</td>
<td></td>
</tr>
<tr>
<td>Bridge Clips for 66 Block, 100 or 1000 per pack</td>
<td>Siemon SA1 series</td>
<td></td>
</tr>
<tr>
<td>Faceplate, single gang, one module space</td>
<td>Panduit CFP11W</td>
<td></td>
</tr>
<tr>
<td>“P” Type Coupler module for CFP1 1W</td>
<td>Panduit CMF1W</td>
<td></td>
</tr>
<tr>
<td>Equipment Rack with PDU 19 Inch</td>
<td>Panduit Kit # 256626140 includes 2 parts (NFR84 Rack and CMRPH15) racket and power strip</td>
<td></td>
</tr>
<tr>
<td>Hinged Door for above rack (2 Req. per rack)</td>
<td>Panduit NFD484 (2 Req.)</td>
<td></td>
</tr>
<tr>
<td>D Ring Kit for above rack (2 Req. per rack)</td>
<td>Panduit NFDR4X6K (2 Req.)</td>
<td></td>
</tr>
<tr>
<td>Rack Assembly Components and Grounding Washer Hardened Steel, Electro</td>
<td>Panduit RGW-12-1Y - FIXED</td>
<td></td>
</tr>
<tr>
<td>DESCRIPTION</td>
<td>MANUFACTURER</td>
<td>PART NUMBER</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Zinc Plated. Pack of 12 Rack Grounding Strip, Copper, Tin Plated (1 Req.) Bonding Screw, Thread Forming Hardened Steel, Black Pack of 100. (Required to mount all devices on rack.)</td>
<td>RGS134-1Y RGTBS-1Y</td>
<td></td>
</tr>
<tr>
<td>Main Telecommunications Ground Busbar (MDF) 1/4 x 4 x 12. Copper Ground Busbar</td>
<td>Panduit Harger</td>
<td>GB4B0612TP1-1 GBI 14412J</td>
</tr>
<tr>
<td>Telecommunications Ground Busbar (Use at IDFs ONLY) 1/4 x 2 x 12. Copper Ground Busbar</td>
<td>Panduit Harger</td>
<td>GB2B0306TP1-1 GBI 14212J</td>
</tr>
<tr>
<td>Ground bar Copper 19 inch. Use ONLY in cabinets located in Data Only IDFs. Mount using grounding system components below.</td>
<td>Panduit Newton Harger</td>
<td>RGRB19Y 0040280013 RGBH 14119.25</td>
</tr>
<tr>
<td>Grounding system Components</td>
<td>Panduit</td>
<td>All Panduit grounding components approved.</td>
</tr>
<tr>
<td>Lug for Ground Bar Two Hole, Long Barrel, Crimp, Copper Lug Tin Plated with window</td>
<td>Panduit</td>
<td>LCC W Series. All LCC W Part numbers approved.</td>
</tr>
<tr>
<td>Equipment jumper kit</td>
<td>Panduit</td>
<td>RGEJ series</td>
</tr>
<tr>
<td>Antioxidant Compound</td>
<td>Burndy Panduit</td>
<td>P8A CMP 100 1</td>
</tr>
<tr>
<td>Telecommunications Grounding Conductor Label Kit</td>
<td>Panduit</td>
<td>LTYK</td>
</tr>
<tr>
<td>Belleville Stainless Steel washer 3/8 grounding</td>
<td>Panduit</td>
<td>CW 38 L</td>
</tr>
<tr>
<td>Hardware kit for grounding on Main Ground Bar Main Ground Bar 3/8-inch hardware Telecommunication Ground Bars 1/4 inch hdwr 3 each required for each Telecom Ground Bar</td>
<td>Panduit</td>
<td>HDW3/8-KT HDW1/4-KT</td>
</tr>
<tr>
<td>Lug for ground bar (6 spare required on each ground bar for use by owner. Provide mounting nuts and bolts TMH 262 below)</td>
<td>Burndy</td>
<td>KA4C</td>
</tr>
<tr>
<td>Equipment Rack 19 Inch Wall Mount Swing out Minimum of 19 rack units. Depth 24 inches. Use only in locations where specifically called out. Provide Rack Grounding Strip</td>
<td>Chatsworth Panduit</td>
<td>RGS134 1Y</td>
</tr>
<tr>
<td>Wall Cabinet enclosed, with rear access. 19-inch Rack 24Dx24Wx24H. Metal Door, White. Lock SHALL be keyed to CH751. Shall be used for all Data Only IDFs. Use only where called out. Provide Rack Grounding Strip</td>
<td>Chatsworth</td>
<td>RGS134 1Y</td>
</tr>
<tr>
<td>Wall Cabinet 15.375” H x 22.25” W x 17.66” D To be used ONLY for AV system in Classrooms.</td>
<td>Great Lakes</td>
<td>GL15WMS White</td>
</tr>
<tr>
<td>Patch Panels Angled Modular 24, 48 and 72 Port. Size appropriately. (To be used in Equipment Racks.)</td>
<td>Panduit</td>
<td>CPPLA24WBLY CPPLA48WBLY CPPLA72WBLY</td>
</tr>
<tr>
<td>Patch Panels – Modular 24, 48 and 72 port. Size appropriately. (To be used in Cabinets)</td>
<td>Panduit</td>
<td>CPPL24WBLY CPPL48WBLY CPPL72WBLY</td>
</tr>
<tr>
<td>Stainless Steel Cat. 5e Wall Phone face plate</td>
<td>Panduit</td>
<td>KWP5EY</td>
</tr>
<tr>
<td>Optical Enclosure and Patch Panel, tilt down front</td>
<td>Panduit</td>
<td>FRME Series. Size appropriately to location</td>
</tr>
<tr>
<td>Wall Mount Enclosure</td>
<td>Panduit</td>
<td>FWME Series. Size appropriately to location</td>
</tr>
<tr>
<td>Modular Panel for all Fiber Optic Applications</td>
<td>Panduit</td>
<td>FMP6</td>
</tr>
<tr>
<td>DESCRIPTION</td>
<td>MANUFACTURER</td>
<td>PART NUMBER</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Multi Media Surface Mount Box, 4 position. If Fiber or CATV is called out, or if additional ports are needed, use 6 position Multi Media box.</td>
<td>Panduit</td>
<td>CBX4IW-AY</td>
</tr>
<tr>
<td>Multi Media Surface Mount Box, 6 position. Use for all fiber termination. If CATV cable is to terminate within a Multi Media box use 6 position. If more than 6 ports are needed, use the 12 port Multi Media box below.</td>
<td>Panduit</td>
<td>CBXF6IW-AY</td>
</tr>
<tr>
<td>Multi Media Surface Mount Box, 12 position. Use only as required above.</td>
<td>Panduit</td>
<td>CBXF12IW-AY</td>
</tr>
<tr>
<td>Fiber Optic Jack 50/125 Micron OM3/OM4 Multimode Fiber Optic Module. Duplex LC Pre polished. Use at stations and in patch panels.</td>
<td>Panduit</td>
<td>FLCDMCXAQY</td>
</tr>
<tr>
<td>Fiber Optic Duplex Coupler (one required for each termination.)</td>
<td>Panduit</td>
<td>FADSLCZEI-L</td>
</tr>
<tr>
<td>Modular Jack, RJ45, Category 6, Red</td>
<td>Panduit</td>
<td>CJ688TGRD</td>
</tr>
<tr>
<td>Modular Jack, RJ45, Category 6A, Blue</td>
<td>Panduit</td>
<td>CJ6X88TGBU</td>
</tr>
<tr>
<td>Blank inserts for Panduit CBXF6IW A</td>
<td>Panduit</td>
<td>CMB1W X</td>
</tr>
<tr>
<td>Power Pole Data and Power 11 and 13 ft. includes two factory installed duplex 120V outlets 20A</td>
<td>Panduit</td>
<td>PCPA11R20IWy</td>
</tr>
<tr>
<td>External Ringer Warble with volume control</td>
<td>Wheelock</td>
<td>UTA 1</td>
</tr>
<tr>
<td>Cable Spillway, 4 inch conduit cable waterfall</td>
<td>Panduit</td>
<td>CWF 400</td>
</tr>
<tr>
<td>Basket Cable Tray waterfalls.</td>
<td>Cable Management Solutions</td>
<td>TO series</td>
</tr>
<tr>
<td>Cable Tray, Various Sizes and Designs depending on application and number of cables</td>
<td>Basorfil</td>
<td>Cable tray All configurations approved</td>
</tr>
<tr>
<td>J Hook for 12 or fewer cables</td>
<td>Caddy</td>
<td>Cat12 All Caddy attachment methods are approved.</td>
</tr>
<tr>
<td>J Hook Angle Extender Bracket For hanging multiple J Hooks</td>
<td>Caddy</td>
<td>CATHBA (X)</td>
</tr>
<tr>
<td>J Hook for 35 or fewer cables</td>
<td>Panduit</td>
<td>JP2W L20 (Velcro loop required for fiber/data)</td>
</tr>
<tr>
<td>Wide Base Cable Support May only be used where other methods of supporting cable will not work. Use must be approved in advance by Owner.</td>
<td>Erico</td>
<td>Caddy Cable Cat 425</td>
</tr>
<tr>
<td>Grommet Edging for holes in sheet metal Edging, Slotted, Flame Retardant, Adhesive, Black</td>
<td>Panduit</td>
<td>GEE _ FR _0 series</td>
</tr>
<tr>
<td>TAK TY Tie Mount, Flame Retardant Nylon, Black 3/4 inch</td>
<td>Panduit</td>
<td>ABMT S6 C60</td>
</tr>
<tr>
<td>Hook and Loop Strapping 3/4 inch wide, NON Plenum, Black, 35 ft. Roll</td>
<td>Panduit</td>
<td>TTS 35 3 O 3 pk.</td>
</tr>
<tr>
<td>Velcro Strap 1/2 inch wide, Plenum rated, Black, 25 yard roll</td>
<td>Velcro/USA</td>
<td>151492</td>
</tr>
<tr>
<td>Outside Loud Bell and Back Box–Passing Bell–10 inch loud bell</td>
<td>Wheelock</td>
<td>43T G10 115 S</td>
</tr>
</tbody>
</table>

WBB S
<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>MANUFACTURER</th>
<th>PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable, 4 Pair, Category 3, Plenum CMP, White or Grey. Use only in locations specified for Cat 3 4pr.</td>
<td>CommScope</td>
<td>3504 White or Grey</td>
</tr>
<tr>
<td></td>
<td>General Cable</td>
<td>2131245 – White</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2131313 – Grey</td>
</tr>
<tr>
<td>Cable, 4 Pair, Category 6, Plenum CMP, Yellow Reels, Payout Box or Spool in a Box.</td>
<td>Belden</td>
<td>2413 Yellow</td>
</tr>
<tr>
<td></td>
<td>General</td>
<td>7131842 Yellow, Spool in a Box, 1000 ft.</td>
</tr>
<tr>
<td></td>
<td>General</td>
<td>7131802 – 1000 ft. Yellow Pull Pac</td>
</tr>
<tr>
<td></td>
<td>General</td>
<td>7131862 1000 ft. Yellow Spool</td>
</tr>
<tr>
<td></td>
<td>Panduit</td>
<td>PUP6C04YL-W</td>
</tr>
<tr>
<td></td>
<td>Hitachi Supra</td>
<td>30016-8-YE2 box</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30016-8-YE3 reel</td>
</tr>
<tr>
<td>Cable, 4 Pair. Category 6A, Plenum CMP, Blue</td>
<td>Panduit</td>
<td>PUP6AS04BU UG</td>
</tr>
<tr>
<td></td>
<td>Belden</td>
<td>10GX13</td>
</tr>
<tr>
<td></td>
<td>General</td>
<td>7131819</td>
</tr>
<tr>
<td></td>
<td>Hitachi</td>
<td>Supra 30233-8-BL3 reel</td>
</tr>
<tr>
<td>Cable, 25 Pair, Plenum CMP</td>
<td>General</td>
<td>2131505</td>
</tr>
<tr>
<td></td>
<td>Berk Tek</td>
<td>10032111</td>
</tr>
<tr>
<td>Cable, 50 Pair, Plenum CMP White</td>
<td>General</td>
<td>2131757</td>
</tr>
<tr>
<td></td>
<td>Berk Tek</td>
<td>10032112</td>
</tr>
<tr>
<td>Cable, 100 Pair, Plenum CMP</td>
<td>General</td>
<td>2131758</td>
</tr>
<tr>
<td></td>
<td>Berk Tek</td>
<td>10032113</td>
</tr>
<tr>
<td>Cable, Fiber Optic, Plenum 6 fibers, Single Mode Yellow</td>
<td>Corning</td>
<td>006E88 31131 29</td>
</tr>
<tr>
<td></td>
<td>General</td>
<td>AP0061PNU</td>
</tr>
<tr>
<td></td>
<td>Belden</td>
<td>B9W045</td>
</tr>
<tr>
<td></td>
<td>Panduit</td>
<td>FSDP906Y</td>
</tr>
<tr>
<td>Cable, Plenum CMP, Fiber Optic, 12 Fibers, 50/125 Micron Multimode. OM 3 Laser optimized capable of 10Ghz at 300 meters Aqua (Do NOT use in tunnels)</td>
<td>Belden CDT</td>
<td>B9C048</td>
</tr>
<tr>
<td></td>
<td>Corning</td>
<td>012T88 33180 29</td>
</tr>
<tr>
<td></td>
<td>General</td>
<td>BE0121PNU</td>
</tr>
<tr>
<td></td>
<td>Panduit</td>
<td>FODP912Y</td>
</tr>
<tr>
<td>Cable, Fiber Optic, Plenum, Interlocking Armor, 12 Fiber 50/125 Micron Multimode, Laser optimized capable of 10Ghz at 300 meters Aqua (Use only in tunnels)</td>
<td>Belden CDT</td>
<td>B9C241</td>
</tr>
<tr>
<td></td>
<td>Corning</td>
<td>012T88 33180 A3</td>
</tr>
<tr>
<td></td>
<td>General</td>
<td>BE0121PNU ILPA</td>
</tr>
<tr>
<td></td>
<td>Panduit</td>
<td>FOPP912Y</td>
</tr>
<tr>
<td>Cable – PA feeder MDF to IDF, Gym, Local speakers and local microphone Plenum CMP, 2 Conductor, #18 stranded, shielded with solid #20 Drain Wire</td>
<td>Belden Cable</td>
<td>6300FE</td>
</tr>
<tr>
<td></td>
<td>General</td>
<td>E2202S</td>
</tr>
<tr>
<td>Cable – CATV RG6, Plenum CMP F Type Connector shall match the coax selected.</td>
<td>Belden Cable</td>
<td>9116P</td>
</tr>
<tr>
<td></td>
<td>CommScope</td>
<td>2275V</td>
</tr>
<tr>
<td></td>
<td>General</td>
<td>C3521</td>
</tr>
<tr>
<td>&quot;F&quot; Type Compression Connector for Plenum RG 6 For all RG 6 Coax listed above</td>
<td>Belden/ICM</td>
<td>FSNS6PL</td>
</tr>
<tr>
<td></td>
<td>Ideal</td>
<td>92 660 Compression Connector</td>
</tr>
<tr>
<td>Feeder Cable CATV RG11, Plenum CMP F Type Connector shall match the coax selected.</td>
<td>CommScope</td>
<td>2285V</td>
</tr>
<tr>
<td></td>
<td>Belden</td>
<td>1523AP</td>
</tr>
<tr>
<td></td>
<td>General</td>
<td>C3528</td>
</tr>
<tr>
<td>&quot;F&quot; Type Crimp On Connector for Plenum RG11 For all RG 11 Coax listed above</td>
<td>Ideal</td>
<td>89 211</td>
</tr>
<tr>
<td></td>
<td>Belden/ICM</td>
<td>716SNS1P11PLA</td>
</tr>
<tr>
<td><strong>Ceiling Speaker</strong> Drop in ceiling (REQUIRED IN ALL ACCESSIBLE CEILINGS)</td>
<td>Bogen</td>
<td><strong>CSD1X2</strong></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Traditional Ceiling speaker to be used only if lay in ceiling tile type speaker cannot be used. Round ceiling speaker/transformer/baffle solution for ceiling installations</td>
<td>Bogen</td>
<td>S86T725PG8WVR RE84 enclosure</td>
</tr>
<tr>
<td><strong>Gym Bogen PA</strong></td>
<td>Bogen</td>
<td><strong>FMH15T(horn)</strong> <strong>BBSM6 (surface) BBFM6 (flush) SGHD8 (grille) FMHAR8 (adapter ring)</strong></td>
</tr>
<tr>
<td><strong>Horn:</strong> Flange-Mounted reentrant horn loudspeaker</td>
<td><strong>Wall Mount</strong> <strong>Flush-Mount Enclosure</strong></td>
<td><strong>RE84 enclosure</strong></td>
</tr>
<tr>
<td><strong>Surface Mount:</strong> Surface-Mount Enclosure</td>
<td><strong>Floor Mount</strong> <strong>Flush-Mount Enclosure</strong></td>
<td><strong>Grille:</strong> <strong>Adapter Ring:</strong></td>
</tr>
<tr>
<td><strong>Flush mount:</strong> Flush-Mount Enclosure</td>
<td><strong>Baffle:</strong></td>
<td><strong>Bogen</strong> <strong>MB8TSQ(VR) MB8TSL(VR)</strong></td>
</tr>
<tr>
<td><strong>Grille:</strong></td>
<td><strong>Adapter Ring:</strong></td>
<td><strong>Wiremaid Vutech</strong> <strong>CG061212 XX CG10414 XX</strong></td>
</tr>
<tr>
<td><strong>Microphone Plug/Jack</strong></td>
<td><strong>Music Input Jack</strong></td>
<td><strong>Canon or Equal XLR 3 pin</strong> <strong>¼ inch (6.3 mm) Phono Jack. Monaural</strong></td>
</tr>
<tr>
<td><strong>Wire Speaker Guard Heavy Duty Steel (Chrome)</strong></td>
<td><strong>70/25 Volt transformer. Full steel construction. White.</strong></td>
<td><strong>Ceiling Mount Flat enclosure</strong> <strong>Wall Mount Enclosure Angled Down</strong></td>
</tr>
<tr>
<td><strong>WireGuard 11 x 11 x 6 (Wall Speaker and SPT 5 7.5 watt horn)</strong></td>
<td><strong>14 x 14 x 10 (SPT 15 15 watt)</strong></td>
<td><strong>Bogen</strong> <strong>MB8TSQ(VR) MB8TSL(VR)</strong></td>
</tr>
<tr>
<td><strong>Music Input Jack</strong></td>
<td><strong>Microphone Plug/Jack</strong></td>
<td><strong>Canon or Equal XLR 3 pin</strong> <strong>¼ inch (6.3 mm) Phono Jack. Monaural</strong></td>
</tr>
</tbody>
</table>

**RACEWAY AND PATHWAY DESCRIPTION**

<table>
<thead>
<tr>
<th><strong>RACEWAY AND PATHWAY DESCRIPTION</strong></th>
<th><strong>MANUFACTURER</strong></th>
<th><strong>PART NUMBER</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>2 gang surface mount box for Wireless Access wall mount</td>
<td>Wiremold</td>
<td>V5748 2</td>
</tr>
<tr>
<td><strong>Surface Mount Raceway</strong></td>
<td><strong>Panduit</strong></td>
<td><strong>LDPH101WX A X=Length 6, 8 and 10’</strong></td>
</tr>
<tr>
<td><strong>The District Standard Panduit color is International White; Suffix 1W</strong></td>
<td><strong>Panduit</strong></td>
<td><strong>ICFC10IW X OCFX10IW X RAFC10IW X ECFX10IW X TFC10IW X DCEFX10IW X CFX10IW X RAEXIWX X</strong></td>
</tr>
<tr>
<td><strong>One Inch Bend Radius Fittings for LDPH10 raceway</strong></td>
<td><strong>Panduit</strong></td>
<td><strong>ICFC10IW X OCFX10IW X RAFC10IW X ECFX10IW X TFC10IW X DCEFX10IW X CFX10IW X RAEXIWX X</strong></td>
</tr>
<tr>
<td><strong>Inside Corner</strong></td>
<td><strong>Panduit</strong></td>
<td><strong>ICFC10IW X OCFX10IW X RAFC10IW X ECFX10IW X TFC10IW X DCEFX10IW X CFX10IW X RAEXIWX X</strong></td>
</tr>
<tr>
<td><strong>Outside Corner</strong></td>
<td><strong>Panduit</strong></td>
<td><strong>ICFC10IW X OCFX10IW X RAFC10IW X ECFX10IW X TFC10IW X DCEFX10IW X CFX10IW X RAEXIWX X</strong></td>
</tr>
<tr>
<td><strong>Right Angle</strong></td>
<td><strong>Panduit</strong></td>
<td><strong>ICFC10IW X OCFX10IW X RAFC10IW X ECFX10IW X TFC10IW X DCEFX10IW X CFX10IW X RAEXIWX X</strong></td>
</tr>
<tr>
<td><strong>End Cap</strong></td>
<td><strong>Panduit</strong></td>
<td><strong>ICFC10IW X OCFX10IW X RAFC10IW X ECFX10IW X TFC10IW X DCEFX10IW X CFX10IW X RAEXIWX X</strong></td>
</tr>
<tr>
<td><strong>Tee Fitting</strong></td>
<td><strong>Panduit</strong></td>
<td><strong>ICFC10IW X OCFX10IW X RAFC10IW X ECFX10IW X TFC10IW X DCEFX10IW X CFX10IW X RAEXIWX X</strong></td>
</tr>
<tr>
<td><strong>Drop Ceiling Coupler</strong></td>
<td><strong>Panduit</strong></td>
<td><strong>ICFC10IW X OCFX10IW X RAFC10IW X ECFX10IW X TFC10IW X DCEFX10IW X CFX10IW X RAEXIWX X</strong></td>
</tr>
<tr>
<td><strong>Right Angle Entrance</strong></td>
<td><strong>Panduit</strong></td>
<td><strong>ICFC10IW X OCFX10IW X RAFC10IW X ECFX10IW X TFC10IW X DCEFX10IW X CFX10IW X RAEXIWX X</strong></td>
</tr>
<tr>
<td><strong>Single Gang J Box Deep</strong></td>
<td><strong>Panduit</strong></td>
<td><strong>JBP1DIW</strong></td>
</tr>
<tr>
<td><strong>Double Gang J Box Deep</strong></td>
<td><strong>Panduit</strong></td>
<td><strong>JBP2DIW</strong></td>
</tr>
<tr>
<td><strong>T70 Series Surface Mount Raceway</strong></td>
<td><strong>Panduit</strong></td>
<td><strong>T70BIWX T70C1WX T70DWX</strong></td>
</tr>
<tr>
<td><strong>Base</strong></td>
<td><strong>Panduit</strong></td>
<td><strong>T70BIWX T70C1WX T70DWX</strong></td>
</tr>
<tr>
<td><strong>Cover</strong></td>
<td><strong>Panduit</strong></td>
<td><strong>T70BIWX T70C1WX T70DWX</strong></td>
</tr>
<tr>
<td><strong>Divider</strong></td>
<td><strong>Panduit</strong></td>
<td><strong>T70BIWX T70C1WX T70DWX</strong></td>
</tr>
<tr>
<td><strong>T45 Series Surface Mount Raceway</strong></td>
<td><strong>Panduit</strong></td>
<td><strong>T45BIWX T45C1WX T45DWX</strong></td>
</tr>
<tr>
<td><strong>Base</strong></td>
<td><strong>Panduit</strong></td>
<td><strong>T45BIWX T45C1WX T45DWX</strong></td>
</tr>
<tr>
<td><strong>Cover</strong></td>
<td><strong>Panduit</strong></td>
<td><strong>T45BIWX T45C1WX T45DWX</strong></td>
</tr>
<tr>
<td><strong>Divider</strong></td>
<td><strong>Panduit</strong></td>
<td><strong>T45BIWX T45C1WX T45DWX</strong></td>
</tr>
<tr>
<td><strong>Surface Mount Box, metal, single gang for use with wall phones when phone cable is routed through surface mount raceway</strong></td>
<td>Wiremold</td>
<td>V 5748S</td>
</tr>
<tr>
<td><strong>Fire Stop and Smoke Seal Pathway, rated device E Z Path</strong></td>
<td><strong>Specified Technologies, Inc.</strong></td>
<td><strong>EZDP33FWS EZD33 EZD44</strong></td>
</tr>
</tbody>
</table>
| Radius Control Module (spillway) to fit on EZ Path rated devices | Specified Technologies, Inc. | RCM33  
| | | RCM44 |
2.6 REQUIRED COMPONENTS

A. APPROVED MATERIALS LIST
   1. Where materials are listed in the Applied Materials List, they shall be used.

B. ELEVATOR PHONE  The Elevator Contractor shall provide, install and program the elevator phone. The phone shall be model number found in the Approved Materials List of this specification or compatible.

C. FIRE STOP SMOKE SEAL  EZ Path by STI. See Approved Materials List.
   1. Combined device that provides both Fire Stop and Smoke Seal. See Paragraph 2.7 B.

2.7 ACCESSORIES

A. SURFACE MOUNT RACEWAY
   1. Only Panduit LDPH10 Series, T45 or T70 surface mount raceway shall be used. See Paragraph 3.5 D.
   2. The District Standard color is suffix IW and shall be used for all Panduit products.

B. FIRE RATED/SMOKE SEAL WIRING DEVICES REQUIRED –
   1. EZ PATH DEVICE REQUIRED  EZ Path fire/smoke seal rated devices by Specified Technologies, Inc. (STI) shall be used where cables enter the Main Telecommunications Room or an Intermediate Telecommunications Room.
   2. USE WHERE 50 OR MORE CABLES PASS THROUGH A RATED WALL  EZ Path shall also be used at any location where 50 or more cables penetrate a rated wall or floor and must be fire stopped or smoke sealed.
   3. Mount EZ Path per manufacturer’s installation practices.
   4. CAPACITY OF DEVICES  Sufficient capacity of EZ Path devices shall be installed to accommodate all cables plus 50% growth. The nominal capacity of a single EZ Path Series 33 unit is 80 Category 6 & 6A cables. The nominal capacity of a single EZ Path Series 44 unit is 120 Category 6 & 6A cables. Feeder cables, PA cables and any other cable using the pathway shall be taken into account when capacities are calculated and spare capacity is provided.
   5. EXTENSION MODULES  Extension modules shall be used as needed for thicker walls.
   6. RADIUS CONTROL MODULES  Shall be used on the Series 33 and Series 44 devices shall be used if cables exiting the EZ Path device are 6 inches or more from the next cable support, or at any point where there is a sharp bend exiting the EZ Path device.
   7. APPROVED DEVICES  Approved fire and smoke rated devices are listed in the Approved Materials List.

C. HANDHOLE FOR BUILDING ENTRANCE CONDUIT
   1. Manufacturer shall be PenCell per the Approved Materials List.
   2. Cover shall be steel lid supplied by PenCell.
   3. Setting of box shall be slightly below grade, but not so low as to allow water entry or to pond. Make necessary grading modifications.
   4. Install a base of pea gravel a minimum of 12” thick, tamped to minimum 50% compaction shall be provided.
   5. Install hardware cloth of 1/2 inch mesh, 16 Ga. Galvanized, beneath the box and over the gravel. The box shall sit on the hardware cloth.
   6. The gravel shall be below the hardware cloth, not in the body of the handhole.
   7. The area shall slope away from the handhole in such a manner that it is well drained. In no case shall the handhole be installed in a location where surface water can pond.
   8. The top of the cover of the handhole shall be just slightly below grade. In no case shall the highest part of the cover be above grade or at risk of being hit by a lawnmower.
   9. Provide two (2) units. Bolt units together for additional depth make a single ground box.
   10. See the Approved Materials List for part numbers and Figure 12 for construction details.

PART 3 EXECUTION

3.1 ACCEPTABLE INSTALLERS AND CERTIFICATIONS

A. INSTALLATION AND TERMINATION OF DATA CABLES, VOICE CABLES AND FIBER OPTIC CABLES
1. Company certification per Paragraph 1.6 of this Section.
2. Individual certificates for installation personnel.
3. Include all certificates in submittal per Figure 14 of this section.

B. TERMINATION OF PA CABLES
1. Certification per Paragraph 1.6 of this Section.
2. Individual certificates for installation personnel.
3. Include all certificates in submittal per Figure 14 of this section.

3.2 EXAMINATION

A. VERIFY SITE CONDITIONS
1. DISTRICT OWNED FACILITIES There are many District owned buried cables and utilities on the property. All parties need to be aware that District owned facilities on school grounds and in right of way adjacent to school property ARE NOT ON THE ONE CALL system.
2. MANUALLY POTHOLE EXISTING CABLES When crossing existing telecommunications cables, verify the location and depth by manually potholing existing cables.
3. FILE EXCAVATION PERMIT
   a. The District shall be notified prior to any excavation, drilling, fencing, forming or digging of any kind.

B. VERIFY EXISTING CABLE INSIDE AND OUTSIDE THE BUILDING
1. VERIFY existing cable in the building.
2. COORDINATE with the owner to determine which cables are to be protected and saved.

3.3 PREPARATION

A. PROTECTION
1. SCHOOL OWNED UNDERGROUND SERVICES It shall be the sole responsibility and cost of the Contractor to locate, pithole and visually identify all underground services. Many school owned utilities and sewers are not on the One Call System. See Section 3.2 regarding locating of utilities.

   **WARNING - CALL 48 HOURS BEFORE YOU DIG**

   There are underground utilities that are owned by Des Moines Schools. They will NOT be located by Iowa One Call.
   Iowa law REQUIRES anyone doing any excavation, fencing, planting or drilling to call 48 hours in advance.
   Hand dig within 18 inches of any locate mark or flag.
   Des Moines Schools Excavation Permit is REQUIRED.
   Call: Des Moines Schools 515 242 7700
   Iowa One Call 1 800 292 8989

2. REQUIREMENTS FOR WORKING IN MAIN TELECOMMUNICATIONS ROOM THAT IS IN SERVICE DURING CONSTRUCTION The Main Telecommunications Room provides, security, fire protection and service to areas of the building that are not under construction as well as similar services to many other school buildings in this area of town.
   a. This room shall be kept in service 24 hours a day, 7 days a week.
   b. Power to those rooms shall not be interrupted without ONE WEEK advance coordination with the district. Such interruption shall occur only during off hours.
   c. Depending on the circumstances, those interruptions may need to be scheduled on a weekend or school vacation when the buildings are empty. NOTE: Highs School buildings are heavily used at nights and on weekends.
   d. Coordination with the district shall take place at least ONE WEEK prior to any interruption of electrical service.
   e. Care must also be taken during the entire project to keep the Telecommunications Rooms clean, dry and free of dirt, dust and paint overspray.
e. Temporary heat and cooling shall be supplied during construction to keep the rooms between 55 and 80 degrees F. 24 hours a day, 7 days a week.

f. If, in the opinion of the Owner and Program Manager, it is necessary, the Contractor shall build temporary walls, dust barriers, ceilings or water barriers to prevent damage to equipment.

g. The Contractor shall coordinate efforts with the Technology Department of the District ONE WEEK prior to beginning demolition or construction.

h. The Contractor shall be liable for all district costs to replace or repair equipment caused by dirt, dust, water, contamination or other demolition or construction activities.

i. Telecommunications Room shall not be used for any type of Contractor storage of tools or material.

j. Contractor shall call School District Security prior to entering any active Telecommunications Room.

3. REQUIREMENTS FOR WORKING IN INTERMEDIATE TELECOMMUNICATIONS ROOM THAT ARE IN SERVICE DURING CONSTRUCTION

a. This room shall be kept in service 24 hours a day, 7 days a week.

b. Care must also be taken during the entire project to keep the Telecommunications Rooms clean, dry and free of dirt, dust and paint overspray.

c. If, in the opinion of the Owner it is necessary, the Contractor shall build temporary walls, dust barriers, ceilings or water barriers to prevent damage to equipment.

d. The Contractor shall coordinate efforts with the Technology Department of the District ONE WEEK prior to beginning demolition or construction.

e. The Contractor shall be liable for all district costs to replace or repair equipment caused by dirt, dust, water, contamination or other demolition or construction activities.

f. Telecommunications Room shall not be used for any type of Contractor storage of tools or material.

4. POWER INTERRUPTIONS

a. Electrical service shall not be interrupted to the current Telecommunications Rooms and Intermediate Distribution Frames.

b. If it becomes necessary to interrupt service, that interruption must be scheduled ONE WEEK in advance, with the Technology Department of the Des Moines Public Schools.

c. Depending on the circumstances, those interruptions may need to be scheduled on a weekend or school vacation when the buildings are empty.

5. TEMPORARY POWER  The Contractor shall provide temporary power to the main data room and intermediate data rooms as needed.

6. MAINTAIN GROUNDS  Install and maintain a dedicated ground between the Telecommunications Room and the main electrical panel for the building. Since the ground in use at the beginning of the project may be interrupted by the construction process, a new ground shall be provided early in the project. Until the new ground is provided, protect the existing ground or provide a temporary dedicated ground.

7. ENVIRONMENT  During the construction process, Telecommunications Room shall be kept between 55 degrees and 80 degrees F. The electrical Contractor shall provide ventilation with filtered air, and heat or cooling as required by the season and situation.

8. IDENTIFY AND MARK LIVE CIRCUITS  Certain electrical, fiber optic and copper cables to these rooms shall be protected throughout the construction period.

a. Prior to beginning demolition, the Contractor shall identify and mark all electrical circuits, grounds, fiber and copper cables serving the Telecommunications rooms.

b. Cables and conduits shall be marked in such a manner that accidental demolition will not occur.

c. Grounds, breakers and panels shall be marked in such a manner that circuits will not be accidentally turned off, disconnected or demolished.

9. PROTECT LIVE CIRCUITS AND CABLES  Telecommunications equipment, inside cable and outside cables provide service other school buildings or other areas of the building under construction, but not involved with the current phase.

a. The District will work with the contractor to identify and designate certain Telecommunications cables, building entrance cables and equipment to be saved and protected during construction.

b. It shall be the responsibility of the District to identify only one end of the cables to the Contractor.

c. It shall be the sole responsibility of the Contractor to trace the cables back to their source and mark the cable in such a manner that it will be obvious that the cable is to be saved.

d. If it is necessary to reroute the cable or protect it with conduit or in some other manner, it shall be the sole responsibility of the Contractor to take that action.
e. It shall be the responsibility of the Contractor to insure that identified cables are protected throughout the construction process. It shall be the responsibility of the Contractor to take all actions, including, but not limited to: marking, placing signs, re routing or placing in conduit.

10. AT RISK SERVICES It shall be the sole responsibility of the Contractor to protect or re route electrical circuits, electrical cables, telecommunications cables, grounds and any other service to a telecommunications room or area of the building that is at risk. The Contractor shall coordinate with the Engineer and the District to determine which services are "at risk".
   a. If, during the construction process, there is an interruption to a telecommunications facility, that circuit or cable shall hereby be deemed to be "at risk."
   b. Should an interruption occur, the Contractor, all involved sub Contractors, and the District shall meet within 24 hours to determine the cause of the outage and what steps will be taken to prevent any further outages.
   c. Protect, re route or replace that service at no additional cost to the Owner.
   d. Contractor shall have the option of replacing the full length of the cable, or protecting the existing cables.

11. UNSCHEDULED OUTAGE
   a. If, after having been identified to the Contractor, indoor or outdoor Telecommunications cables or conduits are damaged during the construction process, the Contractor shall be responsible for the costs of emergency response and repair.
   b. If, after having been identified, during construction there is an unscheduled power outage, which causes an emergency response by District personnel, loss of student time or loss of staff time, the Contractor shall be responsible for all costs associated with emergency response and the outage.
   c. The Contractor that caused the outage shall remain on site, or return to the site until the problem is resolved and service is restored.

12. DAMAGE AND REPAIR
   a. Should any Telecommunications facilities be damaged, the District shall, at its discretion, either repair the facilities itself or engage an outside firm to make repairs.
   b. Contractor shall be responsible for all costs associated with the repair including costs for personnel, materials, vehicles and equipment.
   c. The District shall have the right to take whatever action it deems necessary to rectify the situation.

3.4 NOT USED

3.5 INSTALLATION

A. GENERAL INFORMATION

1. LOCATION OF DATA, CATV, SPEAKERS AND POWER OUTLETS
   a. The Owner has approved, in writing, the location of all power, data, PA speakers and CATV outlets. Services shall be installed per plan and shall not be relocated during the construction process without written consent of the Owner.
   b. Where outlets are shown on the plan to be near the corner of the room the data and power shall be installed within 12 inches of the corner.

2. SYSTEMS
   a. CATV system See Paragraph 3.5 H.
   b. PA System See Paragraph 3.5 I.

3. OWNER PROVIDE AND INSTALL PHONES
   a. All telephone instruments will be provided and installed by the owner.

4. CABLE LENGTH No fiber or Data cable shall have a total length of more than 260 feet, including both slack loops.

5. SLACK LOOPS AT DEVICE
   a. Provide a slack loop at each data, speaker and CATV outlet.
   b. Conceal the slack loop above the accessible ceiling.
   c. Leave slack loops for speakers at the speaker.
6. INSTALLATION OF MULTI MEDIA BOX Panduit multi media box shall be used for all data outlets.
   a. The Panduit Multi Media box shall be mounted directly on the wall or on a recessed 5 Square box Mfg by
      Randl Industries. It shall not be mounted on a surface mount device box or on raceway.
   b. It shall be mounted such a manner that it is impossible to pull a corner away from the wall or get hands or fingers
      behind the box.
   c. It shall be secured to by at least four screws.
   d. The four port Multi Media box will typically be used. Provide the 6 or 12 port version of the Multi Media box
      when additional ports are required and at all locations where fiber optic cable is called out.
   e. Mount vertically so that the jacks open downward. In no case shall the jacks face upward.
   f. When surface mount raceway is used with a multi media box the surface mount raceway shall be butted up tight
      against the multi media box. Raceway shall not extend inside the box.
   g. There shall be no space between the multimedia box and the raceway
   h. Coordinate with Owner prior to mounting any multi media boxes other than with jacks the bottom.
   i. There shall be a minimum of 6 inches clearance for cables to be plugged in, between the jacks in the multimedia
      box and any obstruction or electrical outlet.
   j. Under no circumstances shall the multi media box be painted.
   k. See the Approved Materials List for part numbers.

7. VELCRO OR HOOK AND LOOP TIE STRAPS
   a. Use Velcro or Hook and Loop tie straps to support and restrain all fiber, voice and data cable. Velcro or Hook
      and Loop tie straps are the single approved method of fastening cable.
   b. Nylon tie straps are not acceptable and shall not be used under any circumstances.
   c. During and after installation, cable shall not be fastened, even temporarily, to a supporting structure by tape,
      nylon tie strap, wire, or by any similar means.
   d. Cables shall be stored so that they are out of the way of other crafts so that damaged does not occur to new cable
      that has just been placed. Great care shall also be taken during the installation and termination process not to put
      cable on the floor where it will be stepped on or have carts rolled over it.
   e. Cables can suffer concealed damaged which permanently destroys electrical or optical characteristics if the cable
      is improperly handled during installation, walked on, kinked, knotted, bent sharply or over stressed during
      pulling. Cables observed in these conditions during any point of the installation process will by definition of this
      specification be considered damaged and shall be replaced by the Contractor at their expense.

8. SPLICES, DAMAGED CABLE OR COMPONENTS  Splices shall not be allowed in any cable.
   a. If a cable is damaged during construction, the cable shall be replaced in its entirety.
   b. Care must be taken during installation to protect cables after they are placed. It shall be stored in an approved
      manner that will maintain the bend radius and not exceed the crush weight, and according to the manufacturer's
      specifications.
   c. Cables shall be stored so that they are out of the way of other crafts so that damaged does not occur to new cable
      that has just been placed. Great care shall also be taken during the installation and termination process not to put
      cable on the floor where it will be stepped on or have carts rolled over it.
   d. Cables can suffer concealed damaged which permanently destroys electrical or optical characteristics if the cable
      is improperly handled during installation, walked on, kinked, knotted, bent sharply or over stressed during
      pulling. Cables observed in these conditions during any point of the installation process will by definition of this
      specification be considered damaged and shall be replaced by the Contractor at their expense.

9. MARK UNTERMINATED CABLES FOR FUTURE USE  Cables that the district intends for future use, but are not
    terminated shall be marked for FUTURE USE per the NEC.

10. REPLACE DIRTY EQUIPMENT OR TERMINATIONS  Equipment or terminations that get dirty after installation
    and prior to acceptance are hereby defined to be damaged and will be replaced by the Contractor at their expense.

11. BUILDING ENTRANCE HANDHOLE  A Voice/data/CATV/fiber service cable handhole and conduit entrance to
    the Telecommunications room shall be provided.
    a. The handhole shall be placed on the Owner's property at the property line.
    b. Two (2) units bolted together are required for depth. See Figure 12 for construction specifications.
    c. Coordinate exact location of handhole prior to beginning installation.

12. BUILDING ENTRANCE CONDUIT  Two (2) conduits, four (4) inches in diameter shall be placed into the main
    Telecommunication Room from the handhole.
    a. Schedule 40 PVC shall be used outside the building, and EMT shall be used within the building.
    b. Conduits shall be buried no less than 36 inches below grade.
    c. If the conduits terminate outside the building, a 24x24 inch pull box shall be placed where the conduits enter the
       building.
    d. Turns between the handhole and the MDF shall be kept to a minimum. A 24x24x6 inch pull box shall be placed
       where the conduit enters the building. If more than two (2) 90 degree turns are necessary to reach the MDF,
       24x24 inch pull boxes shall be installed after turning 180 degrees and every 180 degrees thereafter. Inside the
       building, pull boxes shall be placed at least every 100 feet.
    e. The conduits shall enter the lower PenCell unit horizontally, no less than six (6) inches and no more than twelve
       (12) inches above the pea gravel base. They shall be positioned, oriented and plugged in such a manner that
water or dirt will not enter the conduit system. In every case, the conduit opening shall be at least six inches above the pea gravel base. In no case shall the conduit enter the handhole from the bottom.

f. Bushings shall NOT be installed on the conduits. Duct plugs, as described below, shall be installed as soon as the conduits are placed.

g. Immediately upon installation the conduits shall be sealed with a duct plug, manufactured by Jackmoon. The conduits shall not be left unplugged, even temporarily. See the Approved Materials list for all part numbers.

h. If there is more than one handhole location, duct plugs shall be provided for all conduits in each handhole.

i. A graduated pull string, showing footage markings shall be installed in each conduit.

j. The conduits shall be continuous from the handhole to the data room.

k. It shall be the sole responsibility of the Contractor to insure that proper care is taken to prevent contamination of the conduit.

l. After the conclusion of construction, the Owner shall remove such duct plugs as it deems proper to protect the integrity of the conduit system. The Contractor shall supply a sufficient number of plugs to seal all ends of all conduits.

m. Entrance conduits shall be labeled in the Main Telecommunications room. Labels shall be machine produced labels with lettering at least 1/2 inch high.

n. At the contractor’s option, the conduits may bored directly to the data room. See Paragraph 3.6 A 7 of this specification.

13. INSTALL PULL ROPE, TRACER WIRE AND MAXCELL FIBER INNERDUCT IN ENTRY CONDUIT

a. A pull rope shall be installed in each conduit.

b. A tracer wire shall be installed per Paragraph 3.6.A.1 of this specification.

c. Provide and install a MAXCELL fiber innerduct in one of the conduits.

1) During installation, special attention shall be paid to the manufacturer's procedure for installation of the MAXCELL innerduct, and they shall be carefully followed.

2) A pulling swivel shall be used during installation.

3) See www.maxcellinnerduct.com for manufacturer's installation instructions.

4) If lubricant is required use MaxLube from the manufacturer. See approved materials list.

d. The tracer wire and pull string shall NOT be inside the MAXCELL innerduct.

e. If the conduits are trenched, a warning tape shall be installed 12 inches below grade.

14. INSTALL HANDEOLE PRIOR TO THE GROUND FREEZING FOR THE WINTER

The handhole, conduit, tracer wire, MAXCELL innerduct, warning tape and pull string shall be installed early in the project, and shall in all cases, be in place prior to the ground freezing for the winter.

15. TELECOMMUNICATIONS ROOM CABLE ENTRANCE

Risers or sleeves shall be provided for cables to enter all Telecommunication Rooms.

16. UNIVERSAL CABLING FOR DATA AND VOICE SERVICE

a. Voice service shall typically be provided over Category 6 cable terminated on an RJ45 jack.

b. Separate voice only cables shall be provided ONLY where specifically called out.

17. USE OF THE 2.4 GHz RADIO SPECTRUM PROHIBITED

a. Equipment radiating radio frequency energy in the 2.4 GHz portion of the radio spectrum is prohibited in the project. This includes, but is not limited to, fusion lighting devices, microwave ovens and similar devices where RF is used to excite or heat.

b. The district uses wireless computer networking, which operates in the 2.4 GHz range. Use of devices radiating in the 2.4 GHz band would interfere with the district network.

18. CABLE TO ELEVATOR EQUIPMENT ROOM

a. The Contractor shall install a Cat. 6 data cable to the elevator control box in the elevator equipment room.

b. The cable shall terminate on the “Special Circuits” Marked Elevator Phone

c. The elevator telephone instrument shall be provided by the elevator Contractor per the approved materials list of this specification.

19. INSTALLATION OF COMMUNICATIONS CABLES TO CLOCK, BELL CONTROL, ENERGY MANAGEMENT, CARD ACCESS, PA AND FIRE ALARM, CLASSROOMS, OFFICES, CAMERAS, PROJECTORS AND WIRELESS ACCESS POINTS

Install and terminate cables per Figures 4, 9 and 10 to each of the following:

a. Cat 6 cable to Energy Management Main Controller in the data room.

b. Cat 6 cable to Main Fire Alarm Control Panel in the data room.

c. Cat 6 cable to Card Access Controller in the data room.

d. Cat 6 to the Security Panel in the data room.

e. Cat 6 to Main Power Distribution Panel at building electrical entrance.
e. Cat 6 cable from the Bell Control Switch in the office. Terminate on a separate 66 block
f. Cat 6 cable for all office and classroom data locations marked and labeled with room number and a,b,c etc.
g. Cat 6 cable for all projectors in classrooms marked and labeled with room number and “P”.
h. Cat 6A cable for all camera locations marked and labeled with location and “C”.
i. Cat 6A (two) for each wireless access point marked and labeled locations and “W”.
j. AWG 22/2 Solid shielded with drain from the Music Input in the office. Terminate 66 block
k. AWG 22/2 Solid shielded with drain from PA system to Microphone jack in the office.
l. Coordinate with the Des Moines Schools Technology Department prior to the beginning of installation, to determine exact placement of the cable and termination method.

20. PROVIDE CONDUIT FROM MAIN TELECOMMUNICATIONS ROOM TO HIGHEST PART OF ROOF
   a. 3 inch conduit from Telecommunications Room to highest part of roof per plan.
   b. Provide rigid conduit above roof and EMT inside building.
   c. Extend conduit 36 inches above the roof and install weather head.
   d. Install pull string in conduit in addition to any other cables. Pull string to remain at conclusion of project.
   e. Coordinate routing and final location with owner.
   f. Terminate conduit with fiber bushing in the Main Telecommunications Room.
   g. The conduit and pull string shall be continuous between the roof and the Telecommunications room.
   h. Plug weather head to prevent air infiltration
   i. Insulate conduit if required to prevent condensation.
   j. Bond conduit to building steel for ground.

21. GROMMETS REQUIRED IN BUILT IN WORK SURFACES
   a. Provide grommets in built in work surfaces or counters.
   b. Grommet opening shall be a minimum of three (3) inches in diameter.
   c. Finish with plastic grommet.
   d. Install grommets on 36 inch centers.
   e. Coordinate location of grommets with Owner prior to beginning installation.

22. TELECOMMUNICATIONS ROOMS NOT FOR CONTRACTOR STORAGE
   a. Once installation has begun, telecommunications rooms shall not be used for storage of tools or materials by any contractor.

23. CABLE PLACEMENT BY POWER, BALLAST OR FLORESCENT LIGHTS
   a. Communications cables shall not be placed within 24 inches of a fluorescent light or ballast.
   b. Cables shall not run long distances parallel to power lines.
   c. Cables shall not be installed in the same raceway with ac power.
   d. If impossible to route differently from power, communications cables shall be separated by at least 12 inches from power. Coordinate with Owner prior to installation.

24. TEMPORARY CONNECTIONS As a part of the construction process the contractor shall make temporary connection as needed. Connections would include, but not be limited to elevator phone, PA, fire alarm, security and HVAC.

25. LIGHTNING PROTECTION
   a. Provide lightning protection for all telecommunications cables that enter the building
   b. Provide lightning protection for all cables, which, according to NEC or ANSI/TIA/EIA need lightning protection
   c. Protect per the NEC.
   d. Provide devices from the Approved Materials List.

B. MAIN TELECOMMUNICATIONS ROOM REQUIREMENTS

1. CONSTRUCTION
   a. Finish all walls with 3/4" thick grade A/C plywood.
   b. Paint plywood white semi gloss enamel.
   c. Wall surfaces above the painted plywood and room ceiling shall be painted white.
   d. Mount 4 x 8 plywood sheets vertically with the bottom of the board resting on the floor anchored to the wall.
   e. Mount plywood in such a manner that it will support two Telephone System Units weighing approximately 40 pounds each, and at least 40 additional pounds of auxiliary equipment and cable.
   f. Install cable tray above the plywood on all sides of the room.
   g. There shall be no accessible ceiling in the room, unless required to prevent dirt infiltration.
   h. Seal walls to the ceiling of the room to prevent dirt infiltration.
   i. Sleeves or conduits for cable shall be provided to other areas of the building.
   j. Fire stop or smoke seal per Paragraph 2.7 of this Section.
2. EXPOSED CONDUIT ROUTING
   a. Route exposed conduits in the corners of the room.
   b. Do not route conduit across a wall where equipment or panels can be mounted.

3. CONNECTIONS BETWEEN MAIN TELECOMMUNICATIONS ROOMS, INTERMEDIATE
   TELECOMMUNICATIONS ROOMS AND IDFs
   Provide the following from the MDF to each Intermediate
   Telecommunications Room or IDF:
   a. Fiber Optic Cable  12 strand fiber (Armored cable is required if placed in tunnels)
   b. 2 Category 6a cable.
   c. CATV feeder cable RG11.
   d. See the Approved Materials List for all part numbers.

4. SLACK LOOPS IN TELECOMMUNICATIONS ROOMS
   a. Each telecommunications cable, data, fiber and CATV, shall have a slack loop of approximately 10 feet
      installed in the MDF/IDF.
   b. The slack loops shall be routed in such a way that the cable is out of the way for normal service, and not
      damaged by long term suspension on the back board.

5. INSTALLATION OF 66 BLOCKS AND MAIN DISTRIBUTION FRAME
   a. Terminate two 25 pair cables to the CenturyLink Demarc on the upper left two blocks of the MDF. Use S66 M1
      50.
   b. Mounting of 66 Blocks
      1) 66 blocks shall be wall mounted in orderly rows and columns.
      2) Rows shall be approximately 3.5 inches apart.
      3) Adequate vertical and horizontal wire routing areas shall be provided.
      4) Provide the quantity and type of blocks specified above.
      5) Mount the top of the 66 blocks 5 feet 6 inches (5’6”) above the floor.
      6) Install spools above the 66 blocks.
      7) All cables installed by the contractor shall enter the blocks from the bottom.
      8) All cross connects shall be supported by spools and shall run across the tops of the blocks.
   c. The Contractor shall supply necessary spools, blocks and D rings to make an efficient MDF, which will
      provide routing for cross connect cable to be installed by the District.
   d. Support cable routed on the face of any wall with D rings spaced a maximum of 12 inches on center.
   e. All pairs of Category,6 and 6A cables shall be terminated.
   f. All cables will be identified and numbered as specified in this Section.
   g. The Technology Department of the DMPS must approve any deviation from this layout of the MDF and
      IDF(s) in advance, in writing.
   h. See Figure 5 at the end of this Section for layout of MDF.

6. INSTALL VOICE FEEDER CABLE DMARC ON 66 BLOCKS
   a. FEEDER TO QWEST DEMARCATION
      1. One 25 pair cables will be placed between the MDF and the CenturyLink Demarcation.
      2. Terminated on 66 blocks at both ends.
      3. Label both ends.
7. PROVIDE ONE ADDITIONAL 66 BLOCK TO SERVE PA AND CLOCK SYSTEM
   a. Provide a S66 M1 50 block and mount by the PA equipment in the MDF.
   b. Terminate Category 6 cables from the music input and bell control switch on that block.
8. CROSS CONNECTS BY OWNER   The district will make all cross connects on the frames and install all fiber and
   data patch cords.
9. 110 VOLT CIRCUITS
   a. Provide a minimum of two separate electrical circuits dedicated solely to the voice/data, CATV and PA system
      shall supply 110 VAC a minimum of 20 Amps each.
   b. Six four plex receptacles shall be mounted in the Main Data room. Coordinate the exact location with the
      Owner.
   c. The location and number of the breakers serving this outlet shall be neatly written in indelible ink on the cover
      plate of the outlet.
   d. No other systems (clock, security, energy management, etc.) shall use these circuits. Separate circuits shall be
      provided for any other applications located in the area.
   e. All outlets in Telecommunications Rooms shall be TVSS rated.
10. RACKS REQUIRED  Provide 19 Inch, 7 foot Panduit equipment racks shall be used in the MDF and ALL IDFs.
    a. Where racks or cabinets are specified, Contractor shall install said cabinets and racks.
    b. Unless noted as Owner supplied, Contractor shall provide the rack, cabinet, patch panels, blocks, ground bars
       and other hardware necessary for a fully functional installation.
    c. Assembly rack using paint piercing washers under both the nut and bolt of each member.
    d. Coordinate location of slack loops with Owner.
    e. See the Approved Materials List
11. DATA AND FIBER OPTIC CABLE TERMINATION  All data cable shall be terminated on modular patch panels at
    the MDF. Fiber optic cables shall be terminated at the IDF in Multimedia boxes. See the Approved Materials List.
12. PROVIDE PATCH PANELS FOR 25% GROWTH
    a. Supply a sufficient quantity of patch panels to terminate all data cables, plus 25%.
13. MOUNTING PATCH PANELS
    a. Patch Panels shall be mounted in the rack beginning at the top.
    b. Extend only as far as necessary toward the bottom of the rack.
    c. The district will mount data distribution equipment.
    d. District shall make all cross connects and install all patch cords.
    e. See Figure 6 for rack layout.
14. INSTALLATION OF PATCH PANELS
    a. Mount patch panels in 19 inch racks, unless specifically approved, in advance, in writing by the Owner.
    b. Mount panel using rack grounding strips, paint piercing ground washers and grounding screws.
    c. All assembly shall be performed using bonding screws, washers and hardware per paragraph 22 below and as
       listed in the Approved Materials List.
15. DATA CABLE ROUTING
    a. Route all cable from the backboard to the top of the 19 inch rack then down through cable management devices.
    b. Provide vertical cable management devices.
    c. Station cables typically will route on the back side of the rack leaving the front side open for the Owner to run
       patch cables.
16. RACK ASSEMBLY  Rack shall be assembled using rack grounding strip, paint piercing ground washers and
    grounding screws per paragraph 20 below and as listed in the Approved Materials List.
17. RACK ORIENTATION AND MOUNTING
    a. The Owner will determine the specific location for the rack.
    b. The rack SHALL be bolted to the floor.
    c. All data cables and fiber will terminate on modular patch panels mounted in the rack.
18. FREE SPACE IN RACK AT CONCLUSION OF PROJECT
    a. At the conclusion of the project each rack shall have no less than 40% free space for use by Owner.
19. MAIN TELECOMMUNICATIONS GROUND BAR  See the Approved Materials List for all part numbers.
    a. Provide a Main Telecommunications Ground Bar (MTGB) in the Main Telecommunications Room.
    b. Ground bar shall be installed approximately 18 inches AFF. Coordinate location with Owner.
    c. Telecommunications Ground Bars shall also be installed at each IDF.
    d. The TMGB shall be 1/4 x 4 x 12.
    e. The TGB shall be 1/4 x 2 x 12.
20. TELECOMMUNICATIONS BONDING BACKBONE
a. Each TGB shall be connected back to the Main Ground Bar in the Telecommunications Room by the
Telecommunications Bonding Backbone.
b. Provide a separate dedicated copper cable, green in color. Only the Main Ground Bar shall be connected back
to the building ground field or to the Main Distribution Panel, which is, in turn, connected directly to the building
ground field per J STD 607 A and ANSI/TIA 942.
c. The ground cable shall not run in a common pathway with any other telecommunications, PA, Fire Alarm or
control cable.
d. Do not connect to any other electrical panels, conduits or other equipment.
e. The copper ground cables shall be uncut between the Ground Bars and the Building Ground Field or MDP.
f. The copper ground cable shall be sized to provide less than one ohm resistance to ground for the
telecommunications system.
g. See Figure 15.

21. COMPONENTS FOR BONDING AND GROUNDING SYSTEM
   a. Per J STD 607 A, copper components shall be used for the entire grounding system. Copper or tinned copper
   lugs shall be used to connect the Bonding Conductor for Telecommunications, at the Main Telecommunications
   Ground Bar (TMGB), at all Telecommunications Ground Bars (TGB) if used, and at the electrical service
   entrance.
   b. Install grounding and bonding components per manufacturer’s practices found at:
      http://www.panduit.com/products/InteractiveRoadmaps/104530.swf
   c. High Pressure Compression Type connections: Use hydraulic compression tools to provide correct
      circumferential pressure for compression connectors. Use tools and dies specified by connector
      manufacturer. Use embossing die code or other standard method to make a visible indication that a connector
      has been adequately compressed on grounding conductor.
   d. Provide and install Panduit equipment jumpers from each component installed to the Rack Bonding Strip.
   e. All grounding components shall be manufactured by Panduit unless other manufacturers are specifically called
      out in the Approved Materials List.
   f. Only copper or tinned copper lugs shall be used on all Telecommunications Ground Bars.
   g. Antioxidant compound shall be used on each grounding and bonding connection.
   h. The Contractor shall supply six copper lugs for each TMGB and TGB. They shall be mounted on each Ground
      Bar using silicon bronze nuts and bolts. See Approved Materials List.
   i. In no case shall aluminum conductors, lugs, connectors or fastening hardware be used anywhere in the grounding
      and bonding system.
   j. All equipment, cable trays and racks shall be bonded to the TGB per J STD 607 and Panduit practice above.
   k. Typically, bonding conductors from the equipment run vertically downward from the equipment to the elevation
      of the ground bar, then horizontally around the room to the ground bar, with no sharp corners and as few turns as
      possible. Equipment bonding wires shall be Green #4 AWG See Approved Materials List.
   l. All connections in the entire grounding and bonding system shall be visually verifiable.
   m. Panduit paint piercing washers and paint piercing rack screws may be used to mount all devices placed in the
      rack, in lieu of bonding conductors from the rack to the ground bar

22. SIZE AND RESISTANCE OF GROUND CONDUCTORS The Bonding Conductor for Telecommunications
   (BCT) shall be sized at 2 kcmil per lineal foot of conductor length. It shall typically be the same size as the conductor
   from the Main Electrical Panel to the building grounding electrode. The Telecommunications Bonding Backbone
   (TBB) conductor to each Intermediate Distribution Frame (IDF) shall be sized at 2 kcmil per linear foot of conductor
   length up to a maximum size of 3/0 AWG. If 3/0 AWG is not available, 4/0 AWG may be substituted. The minimum
   size of the TBB for distances under 33 feet shall be No. 2 AWG. The size of the BCT shall be, as a minimum, the
   same size as the TBB.

23. TESTING THE GROUND CONDUCTORS The resistance of the grounding conductor shall be tested with an Earth
   Ground Resistance Tester in accordance with manufacturer's instructions. The results of that test, the method of
   testing, the date of the test, the make and model of tester used, and the name of the person performing the test shall be
   recorded ON THE FACE of the Ground Bar or on a permanent sign placed at each Ground Bar. The Technology
   Department will determine the specific location of all Telecommunication Ground Bars.

24. BONDING OF ALL EQUIPMENT, PATCH PANELS, RACKS AND CABLE TRAYS
   a. Contractor shall bond all racks, equipment and patch panels in the equipment rack according Panduit Practices
      listed above.
   b. Use Panduit rack assembly and bonding components.
   c. Contractor shall bond the rack and every component installed therein to the Telecommunications Ground Bar.
   d. Assemble all components using paint piercing screws and washers per Panduit Practice.
e. Bonding Conductor between ground bar and components shall be #6AWG stranded, green in color.

f. Copper lugs shall be used for all terminations.

g. See the Approved Materials List for all grounding component part numbers.

25. LABEL GROUND SYSTEM COMPONENTS  The MTGB, TGB, BCT, TBB and all other components of the
ground system shall be bonded and labeled in accordance with J STD 607A. See the Approved Materials List for
Label Kit.

26. 110 VOLT REQUIREMENTS FOR HIGH SCHOOLS AND DISTRIBUTION SCHOOLS  Provide at least five (5)
dedicated circuits in the MDF. The location and number of the breaker serving these outlets shall be neatly written in
indelible ink on the cover plate of the outlet. Three circuits shall be on a manual transfer switch.

27. TRANSFER SWITCH AND RECEPTACLE FOR GENERATOR  The Contractor shall install a manual transfer
switch in the Telecommunications Room, connected to a receptacle located outside, for a portable emergency
generator. The outdoor connection shall be an outdoor type male 110 volt receptacle. The manual transfer switch
shall serve three 110 volt circuits in the Main Telecommunications Room. The switch shall be installed in such a
manner that the circuits actually powered in emergency conditions are selectable by breaker. Outlets on the manual
bypass switch shall have red faceplates.

C. INTERMEDIATE TELECOMMUNICATIONS ROOM VOICE/DATA DISTRIBUTION FRAME (IDF)

1. INTERMEDIATE LOCATIONS MAY BE REQUIRED
   a. Intermediate distribution locations may be required to efficiently serve particular areas of the building and to
      limit Data and Fiber cabling to 260 feet, including both slack loops.
   b. Station cables may either terminate at the MDF, or may terminate on IDFs in various parts of the building, which
      are connected to the MDF by feeder cable.

2. ENVIRONMENT, CONSTRUCTION, LIGHTING, LAYOUT, PAINTING, PLYWOOD, DOOR, AND DATA
   CABLE TERMINATION
   a. PLYWOOD  One sheet of plywood, 4x8, mounted horizontally with the bottom of the plywood 36 inches AFF.
      All other requirements for plywood are the same as for the Main Telecommunications Room.
   b. CONSTRUCTION AND ENVIRONMENT REQUIREMENTS  Requirements for IDF(s) are the same as for
      the Main Telecommunications Room listed above.

3. CONNECTIONS BETWEEN MAIN TELECOMMUNICATIONS ROOMS, INTERMEDIATE
   TELECOMMUNICATIONS ROOMS AND IDFs  Provide the following from the MDF to each Intermediate
   Telecommunications Room or IDF:
   a. Fiber Optic Cable  12 strand fiber (Armored cable is required if placed in tunnels)
   b. 2 Category 6a cable.
   c. CATV feeder cable RG11.
   d. Telecommunications Ground. See Figure 15.

4. DATA ONLY IDF
   a. Where specifically called out, an IDF may be identified as a “data only” IDF.
   b. A “data only” IDF typically serves a specific small area as identified on the plans.
   c. Provide feeders from MDF to IDFs.
      1. Fiber Optic Cable  12 strand fiber (Armored cable is required if placed in tunnels)
      2. 2 Category 6a cable.
      3. CATV feeder cable RG11.
      4. Telecommunications Ground. See Figure 15.

5. IDF NUMBERING  The IDF numbers shown on the plans shall be used in the numbering plan for the individual
   station cables.

6. CABLE TERMINATION AT IDF
   a. Layout IDF and terminate similar to MDF.
   b. Patch Panels  same as MDF.

7. ARMORED FIBER OPTIC CABLE IN TUNNELS  If the fiber optic feeder cable from the Main
   Telecommunications Room to any IDF is run through the building tunnel system, the fiber optic cable shall be of
   armored construction.

8. 110 VOLT CIRCUITS
   a. Provide a dedicated 110 VAC 20 Amp circuit at each IDF for the exclusive use of the voice and data equipment.
   b. Provide two four plex receptacles. Coordinate locations with Owner.
   c. All outlets in Telecommunications Rooms shall be TVSS rated.
   d. Coordinate the exact location with the Technology Department.
   e. If other applications are planned for the same area, they shall use a different 110 VAC circuit.
   f. Write location and number of the breaker serving this outlet in indelible ink on the cover plate.
D. PATHWAY REQUIREMENTS

1. CABLE CONCEALED OR IN APPROVED PATHWAYS
   a. Pathways shall be sized so that there shall be 50% spare capacity at the end of the project.
   b. Pathways shall be:
      1. As direct as possible to keep cable lengths as short as possible.
      2. Easily accessible to the owner after occupancy.
   c. Coordinate with owner and engineer manner to find shortest, accessible pathways for telecommunications cables.
   d. In renovation projects, telecommunications cable pathways cannot always be accurately predicted, and may need to be adjusted during construction.
   e. Do not install any cables within 6 inches of roof decking.
   f. UL labeled Teflon covered cables may be used without conduit in concealed but accessible locations, consistent with its UL listing.
   g. Submit a cabling plan to the Engineer and the Owner for approval prior to beginning installation.
   h. All cable shall be concealed by placement in conduit, inside walls, above accessible ceilings or in surface mount raceway unless specifically called out on plans.
   i. In areas where there is no accessible ceiling or the ceiling is open to structure, AND the plan calls for exposed cable tray or exposed cabling, the contractor shall:
      1. Install pathways parallel to or at right angles to structure.
      2. Support cables only from devices and supports intended and manufactured for supporting cables.
      3. Place supports close enough together that cables do not sag more than 4 inches between supports.
      4. Bundle cable neatly with Velcro or hook and loop strapping.
      5. Use of nylon or plastic cable ties are prohibited.

2. CONDUIT, RACEWAY, CABLING AND DEVICE BOXES
   a. All telecommunications conduits shall be 1.25 inches or larger.
   b. Where conduits and boxes can be installed in walls, provide a continuous conduit to accessible ceiling, cable tray or telecommunication rooms in areas without accessible ceilings.
   c. Where conduits can not be installed in walls, provide continuous conduit or surface mount raceway from each telecommunications outlet into the nearest cable tray or accessible ceiling space.
   d. Extend conduit to cable tray system or accessible ceiling with pathway to cable tray.
   e. Use conduit only when hidden from view.
   f. Provide Panduit surface mount raceway in all exposed locations. See Below.
   g. Provide single gang plaster rings for all locations at 18” AFF.
   h. Provide a double gang plaster ring for all boxes at 36 inches AFF.
   i. Provide blank faceplates for all boxes at 36 inches AFF.
   j. Back to back box installation is prohibited.
k. Provide a continuous conduit to an accessible ceiling, cable tray or telecommunication rooms in areas without accessible ceilings.
l. Where data locations are identified on the plan with “Triangle T”, and surface mount raceway is used, there shall be two runs of the LDPH 10 surface mount raceway. One terminating 18” AFF for the multimedia box. The other terminating at 36 inches AFF for a double gang Panduit surface mount box, per the Approved Materials List
3. FIRE ALARM CABLE
   a. Fire alarm cables shall not be in cable tray.
   b. Install in a separate pathway.
4. CABLE ROUTING
   a. Route all cables parallel to or at right angles to building structure.
   b. All cables in the pathway shall take the same route around pipes, ducts, supports and other obstructions.
5. ALL LOW VOLTAGE CABLES EXCEPT FIRE ALARM
   a. All low voltage cables, excepting fire alarm cable, shall follow the same pathway. They shall be placed in the same cable tray, conduit, sleeve, or cable support system. Their presence and number shall be considered in sizing the tray, conduit or support system.
6. CONDUIT AND SLEEVE FILL
   a. Conduits and sleeves shall be sized so the total cross sectional area in use does not exceed 50% of the net cross sectional area of the conduit at any point.
   b. Conduit capacity shall be derated 15% for each 90 degree bend.
7. SIZED FOR GROWTH
   a. Size and install the cable tray and conduit systems so that the pathway has 50% free space for future growth.
   b. Size pathway for growth to include all low voltage applications, including but not limited to: speaker, HVAC control, security, data and voice.
8. ORIENTATION TO BUILDING STRUCTURE
   a. All low voltage cabling shall run parallel to or at right angles to the building structure. This applies to all cables without regard to how they are supported.
   b. Cables in concealed areas that are free running in all directions shall not be accepted. This applies to all low voltage cabling.
9. CABLE TRAY SYSTEM
   a. Cable tray shall be used for any pathway with 50 or more cables. Cable count shall include data, voice, PA, HVAC control, security, CATV and all other low voltage cable except fire alarm.
   b. Wall mount wherever possible, center hung or hung from all thread is acceptable.
   c. Cable tray system shall extend into the Main Telecommunications Room and all IDF rooms.
   d. Install Basket Tray above the plywood on all walls of the Main Telecommunications Room and above the plywood in the IDF.
   e. The Tray shall connect from the area above the plywood to the point where the telecommunications cables enter the room in such a manner as to provide a smooth entry path for cable.
   f. Cable tray shall be grounded to the building ground system with a minimum of a 6 AWG copper cable.
   g. Conduits shall not be attached to the cable tray.
   h. Provide end of tray cable waterfalls where wire drops down from the tray 6 inches or more.
   i. Install tray no closer than 6 inches to the structural ceiling, ducts or pipes, or all other possible obstructions.
   j. Install a minimum of 24 inches from fluorescent lights or ballasts.
   k. Install tray in such a manner that the tray and cable pathway is continuous.
   l. Install corners and bends shall in such a manner to provide a smooth pathway so that cables can maintain proper bend radius.
   m. Where tray changes elevation, cables shall be supported by tray throughout the transition. Where pathway transitions from tray into conduit or sleeves, route tray to within six inches of the conduit or sleeve.
   n. Coordinate cable pathways with other trades. If a pathway conflict exists, notify the General Contractor and Owner within one working day.
   o. Tray and cables shall not "cut corners" of the main pathway.
   p. Basket Tray is recommended tray to be used.
   q. Different sizes are available and should be used as cable counts vary.
r. Use a “Cable Turn Out” where cables leave the tray and drop vertically in such a way that the cable manufacturer’s bend radius can not be maintained or where there are a large number of cables.
10. CONDUIT SYSTEM
   a. All telecommunications conduit shall be at least 1.25 inches in diameter.
b. Terminate all conduits and sleeves with a fiber grommet or bushing.

c. Terminate all conduits at the Main Distribution Frame (MDF) an Intermediate Distribution Frame (IDF), cable tray system, accessible ceiling, or wall box at the location to be served.

d. Provide a pull box on any conduit run over 100 feet.

e. Provide a pull box where conduit turns more than 270 degrees.

f. No more than 100 feet and/or 270 degrees of bends shall be allowed between pull boxes.

g. Pull boxes shall be in accessible areas, and clearly identified on as built drawings.

h. Conduit fill shall not exceed 50% and shall be derated for each bend.

i. Looping of conduit is prohibited.

j. Provide a dedicated conduit from each outlet to the nearest recessed accessible ceiling space, cable tray or extended directly to the telecommunications room.

k. This Section does not apply to the four inch conduits and sleeves used for vertical access in the building.

l. Provide drawing showing in detail location of conduit terminations for each of the various runs and the locations of all pull boxes.

m. Provide a pull string, with footage marks, in each conduit. The pull string shall be left in the conduit and shall be in addition to all the cables placed in the conduit during construction.

11. CLEARANCE FROM ROOF DECKING – No cable or conduit shall not be attached to or installed within four (4) inches of roof decking.

12. SUPPORT AND ROUTE LOW VOLTAGE CABLES PROPERLY

a. Low voltage cable shall not contact ductwork, conduit, pipes, hangers, brackets or support wires.

b. Cable shall be supported only by devices and methods intended for the purpose of supporting low voltage cable per NEC.

c. Use Velcro or hook and loop strapping to secure, route and dress cables.

d. Use of nylon tie straps are prohibited.

13. CABLE INSTALLATION

a. Cables not installed in conduit or trays shall be properly secured and neat in appearance.

b. Comply with NFPA 70.

c. All cables shall be supported from building structure with devices and supports intended for that purpose.

d. Per NEC, cables shall not be tie wrapped to conduits, pipes, ducts, ceiling supports, pipe hangers or to any thing else not designed for support of cables.

e. Comply with the system manufacturer's recommendations as approved by the Architect/Engineer and Owner.

f. Provide all wiring, free of grounds and crosses.

g. Bundle cable between supports and between pathway and device with Hook and Loop strapping.

h. Nylon tie straps or cable ties shall not be used under any circumstances.

i. Cable shall not be fastened, even temporarily, to a supporting structure by nylon tie strap, tape or by any similar means other than by Velcro or Hook and Loop tie straps.

j. Provide spoons, "D" rings or similar brackets for a neat and workmanlike cable installation.

k. Copper cable not in a wireway shall be suspended a minimum of 8 inches above ceilings by cable supports no greater than 36 inches apart.

l. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.

m. Avoid placement of cable parallel to power conductors. A minimum separation of 12 inches shall be maintained when such placement cannot be avoided.

n. Cable bend radius shall not be less than ten times the outside diameter of the cable during installation and once installed.

o. All cabling shall be continuous. Splices are not allowed.

p. Use no more pulling force than specified by the cable manufacturer.

q. It shall be the responsibility of the Contractor to determine from the cable manufacturer, the proper amount of pulling force and any required special techniques.

r. Cable shall not be stressed such that twisting, stretching or kinking occurs.

14. GYMNASIUM LOCAL P.A. CONDUIT, MICROPHONE AND SPEAKER WIRE

a. Conduits for the local P.A. are separate from, and in addition to, the conduits for the building Public Address System.

b. Conduit shall be one inch in diameter.

c. Conduits, speaker wire and a microphone cables shall be installed for a local P.A. system in the gymnasium per plan.
d. Run conduits from the gym office to two speaker locations high on the wall in the gym, suitable for mounting column speakers for use with a local P.A. amplifier.

e. Provided conduit for microphone jacks.

f. Terminate in single gang boxes on the wall of the gymnasium and in a double gang box in the gym office.

g. Terminate conduits in the gymnasium within two feet of the ceiling.

h. Microphone terminations per plan at 18 inches AFF.

i. Provide a two conductor #18 AWG, stranded cable, shielded with #20 drain in each speaker conduit.

j. Provide two cables, (2) #18 AWG, stranded cable, shielded with #20 drain in microphone conduit.

k. Leave a pull string in both conduits in addition to the cables.

15. TELECOMMUNICATIONS PATHWAYS AND SLEEVES INTO EACH ROOM OR OFFICE

a. Provide a sleeve, no less than two and one half (2.5) inches in diameter into each area.

b. A larger number of smaller conduits are not acceptable.

c. All low voltage cables, except fire alarm, shall use the same cable tray, sleeves and pathways.

d. Each instructional area, office and support area shall have sleeves installed to provide a pathway for telecommunications cable to enter the room.

e. Sizes and numbers of sleeves stated in this specification are the minimum number required. More capacity shall be added where cable counts are high.

f. At project completion, no sleeve shall have more than 50% fill of cables.

g. Provide a Cable Spillway at any location where the sleeve is installed in such a manner that cable exiting the sleeve is not supported and descends more than six (6) inches. Cable spillway shall be installed prior to the installation of any cabling.

h. To properly locate the sleeves, the Contractor shall determine cable routes prior to sleeve installation.

i. Locate sleeves so as to minimize cable length.

j. Sleeves shall have fiber or plastic bushings on each end.

k. Sufficient capacity shall be provided to allow for the Owner to have 50% growth at the conclusion of the project.

l. In a room where continuous one inch conduits are installed from all communications outlets to the cable tray, additional sleeves are not required.

16. PROVIDE AT LEAST TWO SLEEVES TO ROOMS NOT ON PATHWAY

If access can not be gained to a particular space from the hallway, access may be provided through an adjacent room, which can be reached from the hallway.

a. If this method is used, two (2) sleeves shall be placed into the room abutting the hall.

b. Conduits from the hallway shall be no less than two and one half (2½) inches in diameter.

17. TELECOMMUNICATIONS ROOM PATHWAYS

a. Tray, risers or sleeves shall be provided for cables to enter all Telecommunication Rooms.

b. The MDF shall have at least two (2) conduits, each no less than four (4) inches in diameter, for access to the accessible ceiling of each floor. Contractor shall add conduits where cable counts are high.

c. All IDFs shall have one (1) conduit four (4) inches in diameter. Contractor shall add conduits where cable counts are high.

d. Sizes and numbers of pathways stated in this specification are a minimum number. Contractor shall add more conduits to maintain a spare capacity of 50%.

e. Size pathways to include all low voltage systems except Fire alarm and allow for growth.

f. Where the sleeve is installed in such a manner that cable exiting the sleeve is not supported and descends more than six (6) inches, a Cable Spillway shall be used to maintain the bend radius of the cable. The Cable Spillway shall be installed prior to installation of cables.

g. All riser conduits shall be labeled in the Main Telecommunications room. Labels shall be machine produced labels with lettering at least 1/2 inch high.

18. WIDE BASE CABLE SUPPORT CADDY CABLECAT 425

Use only where there are 50 or fewer cables.

a. Supports shall be placed a maximum of 36 inches on center, and in some cases, they may be needed even closer together to provide an installation that is neat and workmanlike.

b. Cables shall sag no more than six (6) inches between supports.

c. At points where the cable changes directions, at least two supports shall be used, one parallel to each direction. More may be required if a large number of cables are passing through that path.

d. CableCat 425 shall only be used in locations where the cables and hangers are completely concealed.

e. All supports shall be installed and the pathway complete before any cabling is installed. In no case shall cable be installed for placement in the supports at a later date.

f. All cables in the support shall be bundled together between the supports using Velcro or Hook and Loop ties.

19. SURFACE MOUNT RACEWAY REQUIRED PRODUCTS
a. Contractor shall use Panduit LDPH10 series surface mount raceway.
b. Where there are a larger number of cables Panduit T45 and T70 raceways are approved.
c. Provide one inch bend radius corners and fittings at elbows and where entering and leaving the LDPH10.
d. All surface mount raceway shall be securely anchored to the wall using screws and anchors and installed in a rigid and satisfactory manner.
e. Screws/anchors shall be no further apart than 24 inches on center.
f. Install a screw/anchor within four inches of each end of the LDPH10.
g. AT NO TIME, even temporarily, will double sided tape be used to mount the raceway.

20. USE OF J HOOKS ONLY WHERE THERE ARE FEWER THAN 35 CABLES
   a. In concealed areas where there 35 or fewer cables, “J Hooks” (See Approved Materials List) may be used may be used to support cables.
   b. If there are 12 or fewer cables, Caddy Cat 12 J Hooks may be used in a similar manner.
   c. If Caddy Cat 12 J Hook is used, support fiber and Category 5e cable using a Velcro or Hook and Loop strap passing through the slot on the front of the J Hook.
   d. All other cables (P.A., CATV, and Voice Cable) may be placed in the J Hook in the traditional fashion.
   e. J Hooks shall be placed a maximum of 36 inches on center, and in some cases, they may be needed closer together to provide an installation that is neat and workmanlike.
   f. At points where the cable path changes directions, at least two supports shall be used, one parallel to each direction of travel. More may be required if many cables are passing through that path.
   g. Cables shall sag no more than six (6) inches between supports.
   i. All cables shall be bundled together between supports.

E. INSTALLATION OF DATA, CATV AND POWER OUTLETS
   1. OUTLETS NOT TO BE MOVED DURING CONSTRUCTION  Outlets shall not be moved from what is shown on the plans without written approval of the Owner on a case by case basis.
   2. DATA OUTLET IN LOCATIONS WITH BUILT IN CASEWORK, COUNTERS   If there is a built in counter, coordinate the location of the multi media box and power with the DMPS Technology Department prior to installation.
   3. CABLE TV  Cable TV outlet shall be installed in locations shown.
      a. Each CATV outlet shall have a dedicated coaxial cable terminating in the Telecommunications Room.
      b. The Contractor shall install standard cable TV coaxial cable (RG 6, swept to 1 GHz) and terminate it on standard "F" type connectors in a single gang box located in the wall.
      c. If the CATV outlet is located with a data outlet, it may be installed in the same raceway and in the same Multi Media box provided a 6 port Multi Media Box is used.

F. VOICE, DATA, PA AND FIBER CABLING TERMINATION
   1. TERMINATION OF COPPER CABLE
      a. All cable shall be terminated by installers certified per Paragraph 1.6 of this Section.
      b. All Data cables shall be terminated on modular patch panels at the MDF/IDF and in multi media boxes at the workstation.
      c. Raceway mounted devices are prohibited.
   2. TERMINATION OF FIBER OPTIC CABLE   Installation and termination of the fiber optic cable is base bid.
      a. Terminate and test all fibers at each location shown on the plans.
      b. All fiber strands are to be terminated.
      c. All terminations shall use Dual LC Multi-Mode or SC for Single-Mode connectors. See Approved Materials List
      d. After termination, the pull strength between the connector and the fiber shall not be less than 25 pounds.
      e. Provide dust covers for all spare slots.
   3. FIBER TERMINATION IN TELECOMMUNICATIONS ROOMS
      a. Fiber optic cable shall be terminated in the MDF/IDF.
      b. Terminate all fibers in the MDF in Panduit fiber optic patch panels per the Approved Materials List.
      c. Terminate all fibers in the full IDFs in a multimedia box mounted on the wall beside the data rack.
d. Terminate all fibers in “data only IDFs in a multimedia box mounted to the back wall of the cabinet.
e. Where fiber terminates in multimedia boxes. Fiber optic patch panels are not required.

4. RETAIN TWIST OF PAIRS OF CATEGORY 6 and 6a CABLES
   a. Pairs shall remain twisted together and insulation shall remain on the cable to the termination.
   b. Conductors shall not be damaged when removing insulation.
   c. Wire insulation shall not be damaged when removing outer jacket.

G. STATION CABLE, NUMBERING AND LABELING
1. CABLE AND LOCATION LABELING
   a. Mark each cable, each termination point, wiring block, and each jack.
   b. Use location numbers shown on the plans.
2. CABLE AND LOCATION NUMBERING
   a. Typically, each location will be numbered sequentially with a room number and letter; A,B,C, etc.
      1) Cameras, Wireless Access Points and Projectors numbering shall begin with room or hallway and denoted
         with a “C”, “W” or “P”.
   b. Outlets with multiple data cables shall have a “A”, “B” etc. appended to the cable and jack number.
3. TERMINATE IN NUMERICAL ORDER
   a. Terminate in alphanumerical order on patch panels and blocks.
4. LABEL MULTI MEDIA BOXES
   a. Each location shall be neatly and legibly by hand written label on the top of the multi media box. A Sanford
      brand, black, Series No. 3000, “Sharpie Fine Point Permanent Marker”.
   b. The characters of the label shall be approximately 1/2 inch in height and proportional width.
   c. Each location number shall also be written inside the cover of the multimedia box in the same manner.
   d. Each multi media box shall be labeled with IDF from which that location is served per paragraph above.
   e. Each active port on the multi media box shall be labeled.
   f. Label shall be neatly and legibly written.
   g. Do not write on the removable cover for the retaining screw.
   h. Indelible pen is the only acceptable method of marking jacks and multi media boxes.
   i. Adhesive labels, punch in tags or tape is not acceptable.
5. LABEL UNUSED CABLES FOR FUTURE USE WITH LOCATION
   a. Per the NEC, mark FUTURE USE WITH LOCATION on all newly installed cables that are not terminated.
   b. Should any existing cable be saved for future use, that cable shall be marked for FUTURE USE per ANSI
      standards.

H. CATV CABLEING
1. DESCRIPTION Contractor shall provide, install and terminate coax cable from the Telecommunications Room to
   selected outlets. The remainder of the CATV system will be provided by others.
2. CABLING
   a. Cable TV outlets shall be placed as indicated on the plans.
   b. Install RG 6 Coaxial cables from the Main Telecommunications Room to the locations specified.
   c. Install an RG11 CATV feeder between the Main Telecommunications Room and all IDFs.
   d. Cable shall be continuous. Splices are prohibited.
   e. If the CATV outlet is located with a data outlet, it may be installed in the same raceway and in the same
      Multi Media box provided a 6 port Multi Media Box is used.
3. CABLE AND CONNECTORS
   a. Terminate all CATV cables on F Type connectors.
   b. Match the connector to the cable. Different cable manufacturers and cable part numbers use different F Type
      connectors.
   c. Use the proper sized crimp tool.
d. Connector manufacturer’s practices shall be followed for termination of cable.

4. **NUMBERING CATV CABLES** All CATV cables shall be numbered in accordance with Paragraph 3.5 G above.

5. **CATV COMPANY PROVIDES** any needed splitter or amplification.

6. **BUILDING ENTRANCE** CATV point of presence will be installed by the Cable Company in the Main Telecommunications Room. The district will arrange for installation of the service.

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**I. PUBLIC ADDRESS SYSTEM FOR IN BUILDING ANNOUNCEMENTS**

1. **GENERAL**
   a. Use only components listed in the Approved Materials List.
   b. Contractor shall test speakers and cabling per Paragraph 3.9 A of this specification.

2. **SPEAKERS SHALL BE IN PHASE** Care shall be taken so that multiple speakers in the same area are installed in phase. Follow manufacturer’s practices.

3. **SYSTEM CONNECTIONS TO PA** Owner will make connections from the PA to the Telephone system and the Clock system. Figure 4 is included only as information.

4. **SPEAKER SPECIFICATIONS AND LOCATIONS**
   a. Locate speakers exactly as shown on plans. DO NOT relocate any speaker without written permission from the owner.
   b. Provide speakers per plan. See Figure 1 of this section for symbol list.
   c. Use only speakers listed in the Approved Materials List.
   d. Install wall mounted speakers as high as possible.
   e. Coordinate locations with owner prior to beginning installation.

5. **CEILING SPEAKERS TYPICAL**
   a. Typically, speakers that replace one half of a 2x2 ceiling tile will be used.
   b. In hard ceilings, if traditional ceiling speakers are indicated, provide back boxes and mounting hardware.

6. **SPEAKER LOCATION, HEIGHT AND TYPE**
   a. Wall mounted speakers shall be mounted as high off the floor as possible, and in no case with the bottom of the speaker lower than 10 feet above the floor.

7. **GUARDS AROUND SPEAKERS** – Provide guards per plan.

8. **WALL MOUNTED VOLUME CONTROLS** Wall mounted volume controls are prohibited.

9. **MICROPHONE CABLE AND TERMINATION**
   a. Terminate on a 3 Pin XLR wall jack mounted on a single gang box.
   b. XLR Pin out: Pin 1 Shield. Pin 2 “+ or Hot” (Red) Pin 3 “-” (Black) See Figure 8.
   c. Provide a dedicated, cable from the jack to the MDF. Terminate on 66 blocks.
   d. Use same cable as speaker. See the Approved Materials List.
   e. Provide slack loops as specified.
   f. Terminated on VAR 1 module in MDF.
10. MUSIC INPUT  An auxiliary input to the amplifier shall be provided. The auxiliary input shall be located at the
    Building Secretary's workstation.
    a. Terminate in a single gang box. Coordinate exact location with owner prior to rough in.
    b. The input shall be on a 1/4 inch phono plug per Figure 10.
    c. Provide a dedicated, cable from the jack to the MDF.
    d. Use 18 ga. Shielded 2 conductor cable.
    e. Terminate and identify on a separate 66 block by the PA System. (Cable for the Bell Control Switch shall also
       terminate on this 66 Block.)
    f. All cross connects will be made by District personnel.

11. NUMBERING OF SPEAKER CABLES
    a. Each speaker cable shall be numbered with a unique number.

12. TEST ALL SPEAKER CABLES
a. All speaker cables shall be tested per Paragraph 3.9 A 1 d of this specification.
b. Testing shall be completed at least two weeks prior to occupancy by the Owner.
c. Test results shall be provided to the district immediately upon completion.

13. OCCUPANCY ADJUSTMENTS When requested during the warranty period, Contractor shall provide on site assistance in adjusting speaker volume or changing speaker taps to suit the actual occupied conditions. Provide up to two visits to the site outside normal occupancy hours for this purpose, without additional cost.

J. DATA JACK AT LOCATIONS MARKED "WAP", "C" and “P”
1. Data locations marked "C" are for cameras.
2. Data locations marked "WAP" are for Wireless Access Points requires (2) Category 6A cables.
3. Data locations marked with “P” are for Projectors
4. C and WAP locations are cabled with Category 6A cable.
5. P locations are cabled with Category 6 cable.
6. Leave a 20 foot slack loop typically above the door to the room.
7. Coil slack loop and secure to the wall with Hook and Loop strapping.
8. Terminate on blue Panduit Category 6a jack per the Approved Materials List.
9. Install jack in a single surface mount block. Do not attach block to the wall.
10. Number jacks per plan.
11. Numbering for Camera and Wireless Access Points and Projector locations shall be numbered with room number or hallway number.
12. Terminate on a separate patch panel.
13. The Contractor will install the Cameras and the Wireless Access Points.

K. INSTALLATION OF AV CABINETS AT TEACHER WORK STATIONS BY OWNER
1. Space for A wall mounted cabinet shall be provided at each location designated by “Triangle T”.
2. The cabinet will be installed by Owner.
3. Typically, the bottom of the cabinet shall be 40 inches AFF.
4. Where data conduits are recessed in the wall, the cabinet will be mounted over the data conduit.
5. Provide a 1.25 inch conduit or two (2) surface mount raceways from accessible ceiling to serve the AV box and Teacher’s workstation.
6. Where recessed conduits are used:
   a. Provide a 4 Square box with double gang plaster ring at 36 inches AFF
   b. Provide a 4 Square box with single gang plaster ring for data at 18”’ AFF.
   c. Install both boxes on the 1.25 inch conduit to accessible ceiling.
7. Where surface mount raceway is used, provide two surface mount raceways from accessible ceiling:
   a. Provide one surface mount raceway to a double gang surface mount box at 36 inches.
   b. Provide one surface mount raceway to the multimedia box for data at 18 inches AFF.
8. Install the surface mount raceways in such a manner that they will not interfere with the 24x24 cabinet to be installed by the owner.
9. The number by the triangle shall indicate the number of data jacks to be installed at 18 inches AFF.
10. Coordinate with owner prior to rough in or installation of raceways.
11. A wall mounted cabinet shall be provided at each location designated by “Triangle T”.
12. Cabinet shall be 24x24x18, manufactured by Great Lakes, per the Approved Materials List.
13. Typically, the bottom of the cabinet shall be 40 inches AFF.
14. Mount cabinet in a sturdy fashion and so that the door swings appropriately.
15. Where data conduits are recessed in the wall, the cabinet shall be mounted over the data conduit.
16. Provide a 1.25 inch conduit or two surface mount raceways from accessible ceiling to serve the AV box and Teacher’s workstation.
17. Where recessed conduits are used:
   a. Provide a 4 Square box with double gang plaster ring at 36 inches AFF
   b. Provide a 4 Square box with single gang plaster ring for data at 18”’ AFF.
   c. Install both boxes on the 1.25 inch conduit to accessible ceiling.
18. Where surface mount raceway is used, provide two surface mount raceways from accessible ceiling:
   a. Provide one surface mount raceway to a double gang surface mount box at 36 inches.
   b. Provide one surface mount raceway to the multimedia box for data at 18 inches AFF.
19. Install the surface mount raceways in such a manner that they will not interfere with the 24x24 cabinet.
20. The number by the triangle shall indicate the number of data jacks to be installed at 18 inches AFF.
21. Coordinate with owner prior to rough in or installation of raceways.
3.6  CONSTRUCTION

A.  SPECIAL TECHNIQUES

1.  TRACER WIRES REQUIRED ON ALL UNDERGROUND SERVICES
   a.  The Contractor shall install a tracer wire for ALL new underground services.
   b.  These services shall include, but not be limited to:
      1)  Geo Thermal pipes
      2)  Gas
      3)  Water
      4)  Power
      5)  Cast iron sewer
      6)  PVC sewer
      7)  Roof drains
      8)  Footing Drains
      9)  Parking lot lights
     10)  Signs
     11)  CATV lines
     12)  ALL communications facilities
   c.  Install an underground warning tape 12 inches below grade if trenched.
   d.  Tracer wire shall be No. 12 AWG, copper wire designed for direct burial application. See Approved Materials List.
   e.  There shall be no splices in any tracer wire.
      1)  If, due to vandalism or damage, it is found that a splice is necessary, it shall be made ONLY with the express approval and under the supervision of the Owner.
      2)  The splice SHALL be made by a licensed electrician.
      3)  The materials listed in Paragraph 2.5A of this section shall be used to make the splice. No substitutes.
   f.  Tracer wires that do not work properly after installation or at any time during the warranty period shall be replaced, in their entirety, by the contractor at no cost to the owner.
   g.  The owner shall have sole discretion to allow a splice in the tracer wire in lieu of replacement. Typically splices will not be allowed and the tracer shall be replaced.
   h.  Should the Owner allow a splice, the splice kit used for the splice is specified in this section paragraph 2.5.
   i.  The splice shall be made only by a licensed electrician.
   j.  The splice shall not be covered up or concealed until it has been inspected and tested by the owner. If a splice is inadvertently covered up prior to inspection and testing, the contractor shall expose the splice for said inspection.

2.  TERMINATION OF TRACER WIRES
   a.  Wires shall be grounded at the main or “out” end.
   b.  Terminate the tracer wire in an accessible location on the outside wall of the building.
   c.  Clearly mark as to function.
   d.  Terminate on one terminal of a 5533 block.
   e.  Ground the other terminal on the 5533.
   f.  Mount the 5533 block shall be 36 inches above grade per Figure 11.
   g.  Provide 1/2 inch rigid metal conduit for tracer wire and ground wire between the 5533 and grade.
   h.  Provide a separate 5533 block for each tracer wire.
   i.  Water, sewer, well field and any other tracer wire where one end is at an inaccessible location shall be attached to a ground rod buried at the main, trunk or at the end of the run.
   j.  Tracer wire locations shall be documented on the as built drawings.
   k.  See paragraph 2.5A for part numbers and Figures 11 and 13.

3.  TRACER WIRE HANDBOLE
   a.  Where it is not possible to terminate the tracer wire on the outside wall of building, pole or other structure, the tracer wire shall be terminated in a handhole set at grade level.
   b.  The wire shall be terminated on a 5533 block inside the handhole.
   c.  The terminal shall then be placed in the tracer wire handhole.
   d.  See the Approved Materials List in Paragraph 2.5A for handhole part numbers.

4.  PIPES AND DUCTWORK ABOVE OR IN TELECOMMUNICATIONS ROOM ARE PROHIBITED
a. The Main Telecommunications Room, Main Distribution Frame (MDF), Intermediate Telecommunications Rooms shall be free from ductwork, HVAC, plumbing and electrical utilities not directly supporting the telecommunications equipment.

b. No pipes of any kind (water lines, steam, sewer, hydronic, air conditioning etc.) shall be allowed in or above the Telecommunications Rooms.

c. Telecommunications rooms shall not be used as a route for other facilities to "pass through".

5. TELECOMMUNICATIONS ROOMS SHALL BE KEPT CLEAN During the construction process, it shall be the sole responsibility of the Contractor to insure that new and existing Telecommunications Rooms are kept clean, including, if necessary:

a. Sealing openings to the Telecommunications rooms.

b. Building temporary walls, dirt barriers.

c. Filtering air supplies.

d. Taking any other steps to insure that the rooms remain clean.

e. The Des Moines Public Schools Owner’s Rep shall determine what actions the Contractor shall be required to take to meet this Section of the specification.

6. CLEAN ROOM PRIOR TO INSTALLATION OF CABLING OR EQUIPMENT

a. Telecommunications rooms shall be clean and finished spaces prior to the installation of cabling or equipment.

b. Finishes, penetrations, floors, plywood, power and ductwork shall all be complete.

7. DIRECTIONAL BORING

a. The Contractor shall have the option of using directional boring to install underground telecommunications conduits.

b. Should the Contractor choose this technique, he must coordinate with the Owner prior to the beginning of any boring activity.

c. The Contractor shall provide a bore plan to the Owner for approval prior to beginning any activity. Boring shall not start without an approved bore plan.

d. Said plan shall show all utilities and services in the path, their location and depth. It shall show the depth and angle of bore for each length of bore rod, and the plan for avoiding all utilities, services and footings.

e. An “extra” will not be allowed for boring.

f. See the Approved Materials List for innerduct part numbers.

B. INTERFACE WITH OTHER WORK Coordinate with other Contractors and the Owner to provide timely completion and minimize conflicts of systems and workmanship.

C. SEQUENCES OF OPERATION

1. TIMELY COMPLETION OF DATA, VOICE AND PA SYSTEM INSTALLATION In order to give the Owner an opportunity to complete installation of owner installed components, balancing or the PA system and testing prior to building occupancy, the Contractor shall complete installation, cable termination and testing at least TWO WEEKS prior to anticipated date of substantial completion. Should the cabling, speakers and installation not be completed in a timely fashion, the Contractor shall be liable for any overtime caused for district personnel to complete testing and balancing of the system during hours when the building is not occupied.

D. SITE TOLERANCES

1. MAXIMUM CABLE LENGTH Data and fiber optic station cable shall not be longer than 260 feet in length, including both slack loops.

2. CABLE FROM MDF IF POSSIBLE

a. All wiring shall be fed from the Main Telecommunications Room unless maximum cable distance requires being connected to an Intermediate Telecommunications Room.

b. Since pathways cannot be accurately predicted, especially in buildings that are being renovated, the Contractor shall determine which locations shall be served from the MDF or IDF(s), unless specifically called out on the drawings.

c. Serve as many locations from the MDF as possible, without exceeding the footage limitations in this specification.

3. DISCOVERY OF OVER LENGTH CABLE

a. If in the course of installation, the Contractor finds a location that appears to exceed the distance limitation, it shall be the responsibility of the Contractor to field verify the actual distance prior to installing cables.
b. Upon discovery of an over length cable, the Contractor shall cease installation and shall immediately notify the Electrical Contractor, General Contractor and the Program Manager. The Contractor shall follow this notification with a formal Request for Information (RFI).

c. The Program Manager shall consult with the engineer and the Owner to resolve the problem.

d. There shall be no additional payment to the Contractor for re routing of over length cables, which are discovered after installation if the above process has not been followed.

4. OVER LENGTH CABLES
a. The Owner, on a case by case basis, has the option to allow a cable to exceed 260 feet.

b. This will happen only rarely, and must be approved in writing, in advance of installation, by the Technology Department of the Des Moines Public Schools. Contractors shall use the RFI process to obtain the proper approval.

3.7 REPAIR/RESTORATION

A. REPAIR/RESTORATION OF DAMAGED FACILITIES

1. REMEDIAL ACTION
a. Should any active Telecommunications facilities or equipment be damaged, or should a facility be found to be damaged or non functional after substantial completion, the District shall, at its discretion, replace or repair the facilities or engage an outside firm to undertake corrective actions.

b. The District will notify the General Contractor of the action to be taken.

c. The General Contractor shall be responsible for all costs associated with the repair or replacement.

d. The District shall have the right to take whatever action it deems necessary to rectify the situation.

e. The General Contractor shall be responsible for fully loaded costs for personnel, materials, vehicles and equipment. Overtime shall be charged for emergency response or time to repair outside of the regular working hours.

f. The District shall inform the General Contractor of the cost to repair within 30 business days of the damage/outage.

g. The District shall, by deduct change order, withhold that amount from payment owed the General Contractor.

h. The District shall not make any attempt to affix blame on any sub contractor. That shall be the sole responsibility of the General Contractor.

3.8 RE-INSTALLATION - Re installation of any component is subject to all provisions of this specification.

3.9 FIELD QUALITY CONTROL

A. SITE TESTS

1. TESTING Upon complete system installation, Contractor shall test the system. All terminated fiber, Data and Category 6 & 6A cable shall be tested to insure proper performance. Cables, which contain failed circuits, shall be replaced and retested to verify the standard is met. The following tests shall be performed

a. FIBER OPTIC CABLE TESTS

1) Tests shall be performed from both ends of each circuit.

2) Visually inspect each connector for scratches, pits or chips and shall be re terminated if any of these conditions exist.

3) Test each fiber for insertion loss at 850 and 1300 nm using a fiber optic certification test set. Fibers that do not meet the criteria of TIA/EIA 568B.1 shall be replaced and/or re terminated and then retested to verify the standard is met.

4) Include the calculated maximum link attenuation acceptance values along with the actual test result for each fiber tested.

b. DATA CABLE TESTS

1) Verify correct color coding and termination of each pair in the communications closet and at the outlet.

2) Tests shall be completed and all errors corrected before any other tests are started.

3) All UTP links shall be tested using an approved test set.

4) Testing shall use the Permanent Link Test procedure.

5) Cables, which contain failed circuits, shall be replaced and retested to verify the standard is met.

c. PA SPEAKER TESTS
1) The contractor shall measure the resistance of all speakers
2) Testing shall be completed at least two weeks prior to occupancy by the Owner.
3) Test results shall be provided to the owner immediately upon completion and no less than two (2) weeks prior to occupancy.

2. FIELD TEST The Engineer may request that a 10% random field retest be conducted on the cable system in the presence of the Engineer at no additional cost to verify documented findings. Tests shall be a repeat of those defined above. If findings contradict the documentation submitted by the Contractor, additional testing can be requested to the extent determined necessary by the Engineer, including a 100% retest. This retest shall be provided at no additional cost.

3. TEST RESULTS
   a. Test results shall be documented and submitted to, and approved by, the Engineer and the Owner before final acceptance will be authorized.
   b. Provide results in both hard copy and electronic format. The hard copy shall be in a 3 ring notebook and be organized by IDF and Jack number.
   c. Coordinate the format of the electronic copy with the Owner.
   d. Contractor shall retain the test results for their own records should warranty issues arise.
   e. Nothing in this Section shall release the Contractor from the responsibility of turning over to the Owner a fully functional, properly installed and terminated voice/data system, including all jacks and patch panels according to this specification. Nothing in this Section shall release the Contractor from any warranty requirements stated elsewhere in this specification.
   f. Speaker tests shall be provided to the owner per paragraph 1 d 5 of this section.

B. INSPECTION Final responsibility for the condition and appearance of all cables in the pathway shall rest with the Electrical Contractor.

3.10 ADJUSTING See speaker tapping specifications in Paragraph 3.5 I.

3.11 CLEANING
A. CLEAN, FINISHED ROOM REQUIRED PRIOR TO INSTALLATION
   1. CLEAN PRIOR TO ACCEPTANCE Telecommunications rooms shall be clean prior to acceptance by the district. All debris shall be removed, the floor shall be cleaned, and the concrete sealed.

3.12 DEMONSTRATION
A. DEMONSTRATION OF OPERATION The Contractor shall demonstrate proper operation of the system to designated district employees prior to acceptance of the system.

3.13 PROTECTION OF CABLES AND EQUIPMENT
A. TELECOMMUNICATIONS CABLES, RACEWAY AND DEVICES SHALL NOT BE PAINTED
   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 also shall not be painted.
   3. CLEANING NOT ACCEPTABLE Cleaning the cable is not acceptable, as that will further damage the cable.
   4. NOTIFICATION It shall be the responsibility of the Contractor to notify Taylor Ohde Kitchell and the Des Moines Schools Technology Department if any cable is painted. Such notification shall be made within one working day of the occurrence, so that representative of the Technology Department of the Des Moines Schools can make assessment of the damage.

B. CARE OF EQUIPMENT IS CONTRACTOR RESPONSIBILITY
1. Care of equipment during storage prior to installation, during installation, and after installation, until Final Acceptance by the owner.
2. Contactor is responsible for damage to or contamination of District owned equipment, whether that equipment was existing or is new equipment that has been installed in the construction area to support construction activities, or to support areas of the building not in the construction area.

C. FREE FROM CONTAMINATION
1. Ensure that any equipment or materials installed pursuant to these specifications is not subjected to dirt, dust, paint, or any other type of contamination from any source, during and after installation.
2. Where District owned equipment or cabling is existing or installed in the construction area, the contractor shall protect it from physical damage or contamination, including electrical damage, dust, dirt, moisture and paint.
3. Care shall be taken to prevent contamination from entering the telecommunications rooms, equipment or distribution panels during construction.
4. New equipment and cabling shall not be installed until the Telecommunications Rooms and pathways are completed.

D. NOTIFICATION OF CONTAMINATION
1. Should any contamination occur, the Contractor shall immediately notify the Program Manager that such contamination has occurred.
2. Notification shall be made within one business day of discovery.
3. Notification must be made PRIOR TO THE BEGINNING of any clean up effort, so that assessment of the damage can be made by a representative of the Technology Department of the Des Moines Schools.

E. CLEAN UP OF DAMAGED EQUIPMENT
1. It shall be the sole responsibility of the District to determine whether contaminated equipment can be satisfactorily cleaned or will need to be replaced.
2. Clean up, if authorized by the District, will be the sole responsibility of the Contractor.
3. The act of authorizing clean up of contaminated equipment in no way obligates the District to accept said equipment if clean up, in the opinion of the District, does not restore the equipment to original condition.

F. DISTRICT MAY NOT ACCEPT DAMAGED EQUIPMENT
1. The District reserves the right to refuse to accept equipment, cable, patch panels, terminating hardware or any other item that has been contaminated or damaged, whether or not the Contractor has cleaned the equipment.
2. It will be the sole responsibility of the Contractor to replace the damaged equipment, if, in the judgment of the District, the equipment will not perform properly throughout its intended useful life.

G. REPLACEMENT OF DAMAGED EQUIPMENT If, in the sole opinion of the Des Moines Public Schools Technology Department, a cable, termination hardware or piece of equipment is damaged prior to acceptance of the building by the district, it shall be replaced, in its entirety, by the Contractor, at their expense. It shall be in the sole judgment of the Des Moines Public Schools Technology department as to whether an item is deemed to be damaged.

H. ENVIRONMENT CONSTRUCTION It should be remembered that the electronic equipment located in the rooms is basically a computer, which shall be clean, dry and in a temperature and humidity controlled environment. Provide cable management to properly support all cable. Installation of all cabling and equipment within room shall be coordinated with the DMPS Technology Department prior to installation.

3.14 FIGURES
A. Figures 1 through 16 follow this page and are hereby made a part of this specification Section 16740.
Figure 1

SYMBOLS FOR DRAWINGS
Des Moines Public Schools

▲ F  Fiber Outlet 18 Inches AFF unless noted on drawing.
▲ D  Cat 6 Data outlet 18 Inches AFF unless noted on drawing.
▲ V  Cat 3 Voice outlet 18 Inches AFF unless noted on drawing.
▲ W  Wall outlet 48 Inches AFF unless noted on drawing. Single gang plaster ring.
▲ P  Projectors
▲ S  Spare empty Data conduit with pull string, for future use.
▲ TC  Time Clock
▲ C  Camera – Terminate Cat 6. Suspend 5 ft slack loop above ceiling at location shown.

TV  Cable TV

Surface mount ceiling speaker – use only on inaccessible ceilings.

Surface mount ceiling speaker – use only in small offices with suspended ceiling.

Ceiling speaker – 1 x 2 fits in lay-in ceiling grid.

Wall mounted speaker as high as possible, no less than 10 feet AFF

Metal Speaker Housing. Wall or Ceiling mounted. MSS = Slanted Housing

Wall mounted horn as high as possible, no less than 10 feet AFF

Bell Control Switch

Microphone Input

Music Input

Signal Bell – Outside approximately 25 feet above ground.

Clock

Examples Of Use
Two data outlets 18 inches AFF unless noted on drawing. Use this method to indicate multiple outlets for any telecommunications device. Cables to be in the same conduit, and terminate in the same multi-media box.

▲ D2  Two data outlets 1.25 inch conduit. Outlet at 36” AFF with double gang plaster ring. Outlet at 18” AFF with single gang ring. Provide two raceways if surface mounted. See plan detail.
▲ T2  Fiber, two data, one voice all at 18 inches AFF, all cables in the same conduit.
▲ F  1-26-09
Figure 2

DES MOINES PUBLIC SCHOOLS EXCAVATION PERMIT

School where locate is requested:

State law requires anyone digging on school property to contact Iowa One Call to locate underground facilities. Many underground facilities on school grounds are owned by the District and will not be located through Iowa One Call. Anyone digging on school grounds SHALL ALSO contact the Des Moines Public Schools Facilities Department, 515 242 7700. Contact shall be made two working days prior to beginning work. Inform Facilities of the date and time of any joint meet that is scheduled. This form must be completed and filed with the Facilities Management Department, 1917 Dean Ave., prior to beginning work. Any company, group or individual engaged in any type of construction, trenching, planting, fencing, placing sign posts, or any other type of digging, that begins work without a permit on file, will be subject to a $500.00 fine.

Company Name: _

Address: _  City: _  State: _  Zip: _

General Phone Number: _

Name of person completing this form: _

Office Phone: _

Cell Phone: _  Pager: _  FAX: _

Describe the project: _

One Call Confirmation Number: _  Joint Meet Number: _

Date work will begin: _  Anticipated finish date: _

I understand it is against Iowa law to use a machine to dig within 18 inches of a locate mark or flag.

Signature of person completing this form: _  Date: _

It is the responsibility of the entity or individual doing the excavation to coordinate a joint locate meeting with the utilities and the school district, and to record the names of all representatives present. This permit MUST be dated, signed and filed prior to beginning of work.

RECORD OF ATTENDANCE - PLEASE PRINT LEGIBLY

Contractor shall record the name or employee number of each representative in attendance. If representative refuses to give their name, ask to see their company ID. If they refuse to produce an ID, write REFUSED. Do not leave blank if representative refuses to identify themselves.

Iowa One-Call Phone Number for Utility Locates and Joint Meets: 1-800-292-8989

Utilities and City of Des Moines

<table>
<thead>
<tr>
<th>Name or Employee #</th>
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<tbody>
<tr>
<td>CenturyLink (formerly Qwest)</td>
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<tr>
<td>Windstream</td>
</tr>
<tr>
<td>MidAmerican Energy Gas and Power</td>
</tr>
<tr>
<td>Mediacom Cable TV</td>
</tr>
<tr>
<td>Des Moines Water Works</td>
</tr>
<tr>
<td>City of Des Moines (sewer and traffic signals)</td>
</tr>
<tr>
<td>Other</td>
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Des Moines Public Schools Department (515-242-7700)

<table>
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<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>DM Schools Facilities Management</td>
</tr>
<tr>
<td>DM Schools Telecommunications</td>
</tr>
<tr>
<td>Custodian of building where work is to be performed</td>
</tr>
</tbody>
</table>
Contractor SHALL Coordinate location, installation, and termination of ALL cables with DMPS Technology Department. Prior to Installation.

Rev 12-3-07
Figure 5

MDF and IDF 66 Block Layout

Main Distribution Frame

Spools

5'6" Above Floor

Separate 66 Block for Bell Control and Music Input mounted by PA System.

Blocks shall be mounted in rows of 4 blocks each. Top of blocks 5'6" above floor. Space between rows shall be 3.5 inches. All cables to enter from the bottom. Owner to install cross connects on top supported by spools provided by contractor.

Terminate feeder from Demarc on top two blocks of Row 1.

If IDF's are used, terminate feeders to IDF's beginning at the top of Row 2 continue on Row 3 and 4 if needed. Blocks for Row 1 - 566 M1-50. Blocks for Rows 2 and higher shall be RJ21X.

Terminate cables on the left side of the block only, so that bridge clips are needed to complete the circuit.

66 Blocks to be provided according to specification Section 3.5.C.5. See Approved Materials List.

Revised 2-8-08
Figure 6

Data Rack Layout

Owner will supply and install switches.

Contractor provide angled patch panels. Size and quantity as needed.

Pattern repeats as far down as needed.

Coordinate with owner prior to beginning installation.

Owner will install data switches and additional patch panels and equipment below contractor installed materials.

See Paragraph 2.5 of this section for all part numbers.

96 ports maximum between switches

Camera and WAP only below all other Enet ports

76.50
[1943.1]
44 RACK SP

Ground Rack to ground bar.

Use only Panduit rack grounding components.

2-8-08
Figure 7

Figure 8  XLR Microphone Connector Jack wiring in school office.
Figure 9

For additional information in Sections 13811, 16730 and Figure 4.

**Wireless Clock System Wiring**

Switch, Tone Generator, Relay, Outside Bell and PA

**Switch DPDT Center Off**
- **Normal**
- **Off**
- **Ring**

**Bell Control Switch**
- **Normal**
- **Off**
- **Ring**

**4 pair Cat 3 22 AWG between office and Telecom Room**

**Tone Gen #1**
- **Tone Gen #2**

**Power Pack B120**
- **+24VDC Red**
- **Red**
- **Red**
- **Blue**

**Electrical Contractor to provide and install:**
- DPDT Center Off Bell Control Switch located in school office. Part # GC 35-0151.
- Mounting Plate for DPDT switch. Mounts on single gang box.
- Cabling from switch to Tone Generators, Relay and PA system in Telecom Room.
- Transformer/Relay Power Pack - Watt Stopper B120
- Enclosures per NEC
- Outside bells and Mounting Box - Wheelock 43T-G10-115-5 Silver

**Owner to install:**
- PA System
- Primex wireless master clock and all programming.
Figure 10

Building Secretary’s Work Station
Communications and Power Detail

Mic Jack
18awg 1pr
Shielded
w/ drain

Bell Control
Switch
Cat 3
4 pr

Music Input
18awg 1pr
Shielded

To 66 Block by
PA Amplifier in
Data room.

Coordinate with owner prior
to rough-in.

Electrical contractor shall provide grommets in built-in work
surfaces. Grommet shall be a minimum of 3 inches in diameter.
A grommet shall be located at each data/voice/power location.
Provide additional grommets behind anticipated computer or
printer location. Coordinate locations of grommets with owner.

8-12-07
12-4-07
2-25-08
Figure 11

Tracer Wire Detail

See Paragraph 3.8A for detailed specifications.

School
Mount terminal to outside of building wall 36 inches above grade. Do not cut rubber cover. Thread wires through hole provided. If terminal can not be mounted on exterior wall use handhole per Paragraph 3.8A. Clearly identify each wire at the termination point.

Coordinate location of terminals with owner prior to installation of underground facility.

Tracer wire shall be #12 AWG rated for direct burial. See part number below. Splices are not permitted.

Enclose wires in 1/2 inch or larger rigid conduit. Secure conduit to outside wall of building with 3 conduit straps. Use 2 hole strap. Bridgeport 1901. Conduit to extend 16 inches below grade. Be careful not to damage insulator on tracer wire at bottom of conduit. Use fiber bushing at top and bottom of conduit.

Splices in tracer wire not allowed

Pipes

Place tracer wire above all pipes and conduits. Wrap wire around pipes or secure to pipe with tape or tie. Wire may be placed above pipes 12 inch or larger without securing. Following parts SHALL be used. No substitutions.

Ground Rod - Part # Erie 6158S529
Ground Rod Camp - Burndy GRC-12
One Pair Terminal - Reallnt/Emerson 5533
Conduit Clamps 2 hole - Bridgeport 1901.

"Ibe" or Plastic conduit bushing - Wiremold or similar.

"Tracer Wire Part# - <ries-Tech 1201PE45XX (any color)
1/2 inch or larger rigid conduit 54 inches in length.
2 ea Bushing for Conduit Bridgeport 321
Labels for Tracer Wires - Panduit PST-FO (Pack of 5)
Building Entrance Handhole

Grade level buried cable enclosure manufactured by Pennell. Steel lid and captive bolts. See paragraph 2.7 for construction specifications and paragraph 2.5 for part numbers.

Steel lid one inch below grade.

Two (2) units required to form this handhole.

Units bolt together for added depth to form a single ground box.

Plug conduits with Jackman plugs immediately upon installation.

Conduits shall enter the bottom unit, from the side, at least six (6) inches above the bottom.

No pea gravel inside.

Hardware cloth on top of gravel. 1 1/2 inch 16 ga.

12 inch pea gravel base compacted.

12-9-07
Figure 13

Tracer Wires for Well Fields

- Splices prohibited in tracer wires
- Place tracer on top of pipe.
- Mount 5533 on outside wall of building per Figure 11.
- Terminate tracer wires per Paragraph 3.6A and Figure 11. Splices prohibited.
- Terminate on ground rod at the end of each run.

Where only a single tracer wire and ground are present, terminate on Reliant 5533. If more than two wires, contractor provide handhole per Para 8.6A. Identify each tracer wire. Coordinate location and termination with owner.

Part numbers:
- Ground Rod: Erico 6138529
- Ground Rod Clamp: Burndy GRC12
- Terminal: Emerson 5533
- Handhole: Quazite, 12x12x12, Body PC1212BA12 Cover PC1212CA00
- Tracer Wire: Kris-Tech 1201PE45XX (any color)
- Allentel XLP-USE-12-STR (any color)

Labels for tracer wires - Panduit PST-FO (Pack of 5)
Tracer wire shall be rated for direct burial.
No substitutes.

THHN and similar insulation prohibited.
Figure 14

Submittal Form and Instructions for Section 16740

Contractors shall copy this page and use it as part of their submittal. Place a check mark in front of all included elements. Missing elements will result in automatic rejection of submittal.

Check mark indicates this submittal is for:

(  ) Data/Voice Systems.
(  ) CATV cabling, termination.
(  ) PA System and cabling and termination.

1. Check mark indicates documents attached per Specification 16740, Paragraph 1.5 and 1.6. Failure to attach all required documents will result in automatic rejection of this submittal.

(  ) A. Training certificate for onsite data/voice system installation foreman.
(  ) B. Training certificates for data/voice system installation crew.
(  ) C. Factory certification of company installing data/voice systems.
(  ) D. Certification for company and crew members for PA cable termination.

2. (  ) Contractor shall make a copy of the Approved Materials List, Section 16740, Paragraph 2.5A. Contractor shall place a check mark beside all materials and components to be used. Where more than one product is approved, indicate which will be used. Attach to this statement and submit. Please do not send product sheets unless specifically requested.

3. (  ) Contractor's signed statement. Both Electrical Contractor and Subcontractor(s) shall sign.

Electrical Contractor's and Installer's Statement

The undersigned agree to supply and install materials per this specification, and use materials listed in the Approved Materials List as stated in Section 16740, Paragraph 2.5A. A copy of the Approved Materials List is attached. Items to be provided are identified by a check mark. If the specification allows choices of products, the Contractor shall indicate which of the products has been selected. If the indicated products are not provided, Contractor agrees to replace that product at no cost to the Owner.

Electrical Contractor: _
Address: _
City, State, Zip: _
Phone: _
FAX: _
Signature: _
Name Printed: _
Date: _

Contractor’s Installer: _
Address: _
City, State, Zip: _
Phone: _
FAX: _
Signature: _
Name Printed: _
Date: _

11/5/09
Figure 15 - Telecommunications Grounding

**Telecommunications Grounding**

Provide a separate dedicated copper cable, green in color. Only the TMGB shall be connected to the Building Grounding Electrode System. Each TGB shall be connected to the TMGB by separate cable. Do not connect ground cables to any other panels, conduits or equipment. Ground cables shall be uncut between ground bars and the building grounding system.

Use ONLY copper lugs listed in the Approved Materials List, Paragraph 2.5. Use Panduit or Bynco crimp tools with the die specified by Panduit for the lug being crimped.

See Paragraph 3.5 B 18+ for detailed information.

3-3-08
Figure 16 - Grounding Hardware Installation on TGB

END OF SECTION
SECTION 271000
STRUCTURED CABLES

PART 1  GENERAL

1.01  SECTION INCLUDES

A. Communications system design requirements.
B. Communications pathways.
C. Communications outlets.

1.02  RELATED REQUIREMENTS

A. Section 260533.13 - Conduit for Electrical Systems.
B. Section 260536 - Cable Trays for Electrical Systems.
C. Section 260533.16 - Boxes for Electrical Systems.
D. Section 262726 - Wiring Devices.

1.03  REFERENCE STANDARDS

C. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
E. TIA-568.2 - Balanced Twisted-Pair Telecommunications Cabling and Components Standards 2009c, with Addendum (2016).
F. TIA-569 - Telecommunications Pathways and Spaces 2019e.
G. TIA-607 - Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises 2019d.
H. UL 444 - Communications Cables Current Edition, Including All Revisions.

1.04  SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer’s standard catalog pages and data sheets for each product.
C. Sustainable Design Documentation: Submit manufacturer’s product data on cable and cable insulation showing compliance with specified lead content requirements.
D. Evidence of qualifications for installer.
E. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and operation of product.
F. Field Test Reports.
G. Project Record Documents: Prepared and approved by BICSI Registered Communications Distribution Designer (RCDD).
   1. Record actual locations of outlet boxes and distribution frames.
   2. Show as-installed color coding, pair assignment, polarization, and cross-connect layout.
   3. Identify distribution frames and equipment rooms by room number on drawings.

H. Operation and Maintenance Data: List of all components with part numbers, sources of supply, and operation and maintenance instructions; include copy of project record documents.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: A company having at least 3 years experience in the installation and testing of the type of system specified, and:
   1. Employing a BICSI Registered Communications Distribution Designer (RCDD).
   2. Supervisors and installers factory certified by manufacturers of products to be installed.

PART 2 PRODUCTS

2.01 SYSTEM DESIGN

A. Provide a complete permanent system of cabling and pathways for voice and data communications, including cables, conduits and wireways, pull wires, support structures, enclosures and cabinets, and outlets.
   1. Comply with TIA-568 (SET) (cabling) and TIA-569 (pathways) (commercial standards).
   2. Provide fixed cables and pathways that comply with NFPA 70 and TIA-607 and are UL listed or third party independent testing laboratory certified.
   3. Provide connection devices that are rated for operation under conditions of 32 to 140 degrees F at relative humidity of 0 to 95 percent, noncondensing.
   4. In this project, the term plenum is defined as return air spaces above ceilings, inside ducts, under raised floors, and other air-handling spaces.

B. Cabling to Outlets: Specified horizontal cabling, wired in star topology to distribution frame located at center hub of star; also referred to as "links".

2.02 PATHWAYS

A. Conduit: As specified in Section 260533.13; provide pull cords in all conduit.
B. Cable Trays: Use existing, where applicable.

2.03 COPPER CABLE AND TERMINATIONS

A. Copper Horizontal Cable:
   1. Description: 100 ohm, balanced twisted pair cable complying with TIA-568.2 and listed and labeled as complying with UL 444.
   2. Cable Type - Voice and Data: TIA-568.2 Category 6 UTP (unshielded twisted pair); 23 AWG.
   3. Cable Capacity: 4-pair.
   4. Cable Applications: Use listed NFPA 70 Type CMP plenum cable unless otherwise indicated.
   5. Cable Jacket Color - Voice and Data Cable: Blue.
   6. Product(s):
      a. CommScope; SYSTIMAX Twisted Pair Cables; GigaSPEED XL Category 6 U/UTP Cable: www.commscope.com/#sle.

B. Copper Cable Terminations: Insulation displacement connection (IDC) type using appropriate tool; use screw connections only where specifically indicated.
C. Jacks and Connectors: Modular RJ-45, non-keyed, terminated with 110-style insulation displacement connectors (IDC); high impact thermoplastic housing; suitable for and complying with same standard as specified horizontal cable; UL 1863 listed.
   1. Performance: 500 mating cycles.
   2. Voice and Data Jacks: 8-position modular jack, color-coded for both T568A and T568B wiring configurations.
   3. Product(s):

2.04 COMMUNICATIONS OUTLETS

A. Outlet Boxes: Comply with Section 260533.16.
   1. Provide depth as required to accommodate cable manufacturer’s recommended minimum conductor bend radius.

B. Wall Plates:
   1. Comply with system design standards and UL 514C.
   2. Accepts modular jacks/inserts.
   3. Capacity:
      a. Data or Combination Voice/Data Outlets: see drawings.
   4. Wall Plate Material/Finish - Flush-Mounted Outlets: Match wiring device and wall plate finishes specified in Section 262726.

2.05 SOURCE QUALITY CONTROL

A. Factory test cables according to TIA-568 (SET).

PART 3 EXECUTION

3.01 INSTALLATION - GENERAL

A. Comply with latest editions and addenda of TIA-568 (SET) (cabling), TIA-569 (pathways), TIA-607 (grounding and bonding), BICSI N1, NFPA 70, and SYSTEM DESIGN as specified in PART 2.

B. Comply with Communication Service Provider requirements.

C. Grounding and Bonding: Perform in accordance with TIA-607 and NFPA 70.

3.02 INSTALLATION OF PATHWAYS

A. Conduit, in Addition to Requirements of Section 260533.13:

B. Outlet Boxes:
   1. Coordinate locations of outlet boxes provided under Section 260533.16 as required for installation of telecommunications outlets provided under this section.
      a. Mounting Heights: Unless otherwise indicated, as follows:
         1) Telephone and Data Outlets: 18 inches above finished floor.
      b. Orient outlet boxes for vertical installation of wiring devices unless otherwise indicated.
      c. Unless otherwise indicated, provide separate outlet boxes for line voltage and low voltage devices.
      d. Locate outlet boxes so that wall plate does not span different building finishes.
      e. Locate outlet boxes so that wall plate does not cross masonry joints.

3.03 INSTALLATION OF EQUIPMENT AND CABLING

A. Cabling:
   1. Do not bend cable at radius less than manufacturer’s recommended bend radius; for unshielded twisted pair use bend radius of not less than 4 times cable diameter.
   2. Do not over-cinch or crush cables.
   3. Do not exceed manufacturer’s recommended cable pull tension.
   4. When installing in conduit, use only lubricants approved by cable manufacturer and do not chafe or damage outer jacket.
B. Service Loops (Slack or Excess Length): Provide the following minimum extra length of cable, looped neatly:
   1. At Outlets - Copper: 12 inches.

C. Copper Cabling:
   1. Category 5e and Above: Maintain cable geometry; do not untwist more than 1/2 inch from point of termination.
   2. For 4-pair cables in conduit, do not exceed 25 pounds pull tension.
   3. Use T568B wiring configuration.

D. Identification:
   1. Use wire and cable markers to identify cables at each end.
   2. Use manufacturer-furnished label inserts, identification labels, or engraved wallplate to identify each jack at communications outlets with unique identifier.

3.04 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for additional requirements.

B. Comply with inspection and testing requirements of specified installation standards.

C. Visual Inspection:
   1. Inspect cable jackets for certification markings.
   2. Inspect cable terminations for color coded labels of proper type.
   3. Inspect outlet plates and patch panels for complete labels.

D. Testing - Copper Cabling and Associated Equipment:
   1. Test backbone cables after termination but before cross-connection.
   2. Category 5e and Above Backbone: Perform near end cross talk (NEXT) and attenuation tests.

E. Final Testing: After all work is complete, including installation of telecommunications outlets, and telephone dial tone service is active, test each voice jack for dial tone.

END OF SECTION
SECTION 275116
PUBLIC ADDRESS SYSTEMS

PART 1 GENERAL
1.01 RELATED REQUIREMENTS
A. Section 260526 - Grounding and Bonding for Electrical Systems.

1.02 REFERENCE STANDARDS

1.03 SYSTEM DESCRIPTION
A. Public address system for voice.

1.04 SUBMITTALS
A. Project Record Documents: Record actual locations of speakers, control equipment, and outlets for input/output connectors.

PART 2 PRODUCTS
2.01 WIRE AND CABLE
A. Input Cable: 22 AWG copper conductor, 300 volt insulation, rated 60 degrees C, paired conductors twisted together, shielded, and covered with a PVC jacket.
B. Speaker Wire and Cable: 22 AWG copper conductor, 300 volt insulation, rated 60 degrees C, paired conductors twisted together shielded and covered with a PVC jacket.
C. Plenum Cable for Speaker Circuits: 22 AWG copper conductor, 300 volt insulation, rated 200 degrees C, paired conductors twisted together shielded and covered with a nonmetallic jacket; suitable for use for Class 2 circuits in air handling ducts, hollow spaces used as ducts, and plenums.

PART 3 EXECUTION
3.01 INSTALLATION
A. Install in accordance with manufacturer's instructions.
B. Splice cable only in accessible junction boxes or at terminal block units.
C. Make cable shields continuous at splices and connect speaker circuit shield to equipment ground only at amplifier.
D. Install input circuits in separate cables and raceways from output circuits.
E. Leave 18 inches excess cable at each termination at microphone, volume pad, speaker, and other system outlet.
F. Provide protection for exposed cables where subject to damage.
G. Use armored cable for outside speaker circuits.
H. Support cables above accessible ceilings to keep them from resting on ceiling tiles. Use spring metal clips or plastic cable ties to support cables from structure for ceiling suspension system. Include bridle rings or drive rings.
I. Use suitable cable fittings and connectors.
J. Connect reproducers to amplifier with matching transformers.
K. Ground and bond equipment and circuits in accordance with Section 260526.

END OF SECTION
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**CODE PLAN - SECOND FLOOR - OCCUPANT TYPE & LOAD (EXISTING)**

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**CODE PLAN - SECOND FLOOR - OCCUPANT TYPE & LOAD (PROPOSED)**

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**CODE PLAN - THIRD FLOOR - LEVEL-1/LEVEL-2 ALTERATIONS, WORK AREAS & EXIST. FIRE-RATED ASSEMBLIES**

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PLUMBING LEGEND

C: Supply
D: Domestic Cold Water
E: Domestic Hot Water
G: Grease
H: Sanitary
P: Domestic Cold
R: Domestic Hot
S: Domestic Cold Water Supply
T: Domestic Hot Water Supply
V: Drain
W: Sanitary
X: Vent
Y: Trap
Z: Vent Trap

PLUMBING DEMOLITION NOTES

1. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF ALL APPLICABLE LOCAL, STATE, AND NATION- AL CODES, AS WELL AS CONTRACTOR'S WORK PLAN, SPECIFICATIONS, AND DRAWINGS. CONTRACTOR SHALL COORDINATE THEIR WORK REQUIREMENTS WITH LOCAL CODE OFFICIALS AND OWNER.

2. CONTRACTOR SHALL PERFORM SITE VISITS PRIOR TO BEGINNING ANY WORK TO CONFIRM THAT ALL REQUIRED WORK TO COMPLETE PROJECT.

3. WORK NOT SPECIFICALLY SHOWN IN DETAIL REFERENCES OR OTHERWISE IMPLIED SHALL BE PERFORMED IN ACCORDANCE WITH TRADE OR INDUSTRY BEST PRACTICES.

4. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL REPAIRS AND REPLACEMENT OF EXISTING, DISMANTLED OR REMOVED PLUMBING EQUIPMENT, INCLUDING WATER MAINS AND SIDE SERVICE, AS REQUIRED.

5. THE OWNER SHALL RETAIN FIRST RIGHTS TO SALVAGE ALL PLUMBING EQUIPMENT NOTED TO BE REMOVED.

6. CONTRACTOR(S) SHALL UNCONDITIONALLY WARRANTY IN WRITING ALL MATERIALS, EQUIPMENT, AND ATTACHMENTS FOR ONE YEAR FROM DATE OF ACCEPTANCE BY OWNER. CONTRACTOR(S) SHALL PROVIDE FREE SERVICE FOR ALL EQUIPMENT INVOLVED IN THEIR CONTRACT DURING THE WARRANTY PERIOD.

GENERAL PLUMBING NOTES

1. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF ALL APPLICABLE LOCAL, STATE, AND NATION- AL CODES, AS WELL AS CONTRACTOR'S WORK PLAN, SPECIFICATIONS, AND DRAWINGS. CONTRACTOR SHALL COORDINATE THEIR WORK REQUIREMENTS WITH LOCAL CODE OFFICIALS AND OWNER.

2. PROVIDE ALL REQUIRED ACCESSORIES AND EQUIPMENT FOR A COMPLETE OPERATIONAL SYSTEM AND MAINTAIN WARRANTY REQUIREMENTS. VERIFY ALL EQUIPMENT PROVIDED IS SUITABLE FOR INTENDED USE.

3. WORK NOT SPECIFICALLY SHOWN IN DETAIL REFERENCES OR OTHERWISE IMPLIED SHALL BE PERFORMED IN ACCORDANCE WITH TRADE OR INDUSTRY BEST PRACTICES TO PROVIDE A COMPLETE OPERATIONAL SYSTEM.

4. ALL WORK UNDER A SPECIFICATION SHALL BE NEW AND SEPARATE, CONFORMING TO TRADE OR INDUSTRY BEST PRACTICES.

5. CONTRACTOR SHALL COORDINATE THEIR WORK WITH ALL TRADES PRIOR TO START OF WORK.

6. OWNER SHALL RETAIN FIRST RIGHTS TO SALVAGE ALL PLUMBING EQUIPMENT NOTED TO BE REMOVED.

7. CONTRACTOR(S) SHALL UNCONDITIONALLY WARRANTY IN WRITING ALL MATERIALS, EQUIPMENT, AND ATTACHMENTS FOR ONE YEAR FROM DATE OF ACCEPTANCE BY OWNER. CONTRACTOR(S) SHALL PROVIDE FREE SERVICE FOR ALL EQUIPMENT INVOLVED IN THEIR CONTRACT DURING THE WARRANTY PERIOD.

MECHANICAL DEMOLITION NOTES

1. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF ALL APPLICABLE LOCAL, STATE, AND NATION- AL CODES, AS WELL AS CONTRACTOR'S WORK PLAN, SPECIFICATIONS, AND DRAWINGS. CONTRACTOR SHALL COORDINATE THEIR WORK REQUIREMENTS WITH LOCAL CODE OFFICIALS AND OWNER.

2. CONTRACTOR SHALL PERFORM SITE VISITS PRIOR TO BEGINNING ANY WORK TO CONFIRM THAT ALL REQUIRED WORK TO COMPLETE PROJECT.

3. WORK NOT SPECIFICALLY SHOWN IN DETAIL REFERENCES OR OTHERWISE IMPLIED SHALL BE PERFORMED IN ACCORDANCE WITH TRADE OR INDUSTRY BEST PRACTICES.

4. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL REPAIRS AND REPLACEMENT OF EXISTING, DISMANTLED OR REMOVED PLUMBING EQUIPMENT, INCLUDING WATER MAINS AND SIDE SERVICE, AS REQUIRED.

5. THE OWNER SHALL RETAIN FIRST RIGHTS TO SALVAGE ALL PLUMBING EQUIPMENT NOTED TO BE REMOVED.

6. CONTRACTOR(S) SHALL UNCONDITIONALLY WARRANTY IN WRITING ALL MATERIALS, EQUIPMENT, AND ATTACHMENTS FOR ONE YEAR FROM DATE OF ACCEPTANCE BY OWNER. CONTRACTOR(S) SHALL PROVIDE FREE SERVICE FOR ALL EQUIPMENT INVOLVED IN THEIR CONTRACT DURING THE WARRANTY PERIOD.

7. ALL EXISTING EQUIPMENT, FIXTURES, PIPING, VALVES, ETC SHOWN ON THE DRAWINGS ARE AS ACCURATE AS POSSIBLE.

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30. ALL EXISTING EQUIPMENT, FIXTURES, PIPING, VALVES, ETC SHOWN ON THE DRAWINGS ARE AS ACCURATE AS POSSIBLE.
DEMO EXISTING SANITARY PIPING TO ALLOW FOR NEW PIPE. EXISTING RISERS TO SINKS REMAIN. REFER TO NEW WORK PLANS.

ABOVE TO REMAIN. REFER TO ARCHITECTURAL AND NEW WORK PLANS.

KEYED NOTES
1. INDICATE EXISTING THERMOSTAT. REFER TO NEW WORK PLANS.
2. DEMO EXISTING SANITARY PIPE TO ALLOW FOR NEW EXISTING RISERS TO SINKS. REFER TO ARCHITECTURAL AND NEW WORK PLANS.
KEYED NOTES

1. DEMOLISH EXISTING GAS AND PLUMBING PIPING FROM FIXTURE AND REMOVE FIXTURE FROM LOCATION SHOWN. REFER TO ARCHITECTURAL AND NEW WORK PLANS.

2. VERIFY EXISTING GROUND FLOOR GAS AND ELECTRICAL PANELS REMOVED. REFER TO ARCHITECTURAL AND NEW WORK PLANS.

3. VERIFY EXISTING GROUND FLOOR GAS AND PLUMBING PIPING REMOVED. REFER TO ARCHITECTURAL AND NEW WORK PLANS.

4. REMOVE GAS PIPING ABOVE CEILING TO LOCATION SHOWN TO PREPARE FOR REROUTING.

5. REMOVE EXISTING GAS AND PLUMBING PIPING FROM FIXTURE AND REMOVE FIXTURE UNDER SCIENCE CLASSROOM FLOOR. REFER TO ARCHITECTURAL AND NEW WORK PLANS.

NOT TO SCALE

KEY PLAN LEGEND - 3RD FLOOR

- 3/4" G (EX)
- 1/2" G (DEMO)
- 1/2" G (EX)
- 1 1/2" G (EX)
- 1" G (EX)
- 2'-2" +/- RAMP UP
- RAMP UP
- RAMP DN
- DN
- DN
- DOWN
- DOWN
- 26 RSRS
- X
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- P
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- R
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19 DECEMBER 2021
REMOVE EXPOSED PIPING TO WALL AND CAP. REFER TO ARCHITECTURAL.

REMOVE NATURAL GAS PIPING TO RISER AND CAP.

REMOVE NATURAL GAS PIPING ROUTED ABOVE CEILING. REFER TO ARCHITECTURAL.

PLUMBING PIPING TO REMAIN FOR REUSE. REFER TO ARCHITECTURAL AND NEW WORK.

DISCONNECT EXISTING GAS AND PLUMBING PIPING FROM FIXTURE AND REMOVE FIXTURE.

OWNER.

ARCHITECTURAL. SALVAGE EXISTING GAS SOLENOID SERVING EACH ROOM AND RETURN TO OWNER.

KEYED NOTES:
1. DEMOLISH EXISTING GAS AND PLUMBING PIPING FROM FIXTURE AND REMOVE FIXTURE.
   REFER TO ARCHITECTURAL AND NEW WORK.
2. REMOVE NATURAL GAS PIPING ROUTED ABOVE CEILING. REFER TO ARCHITECTURAL.
3. REMOVE NATURAL GAS PIPING TO RISER AND CAP.
4. REMOVE EXPOSED PIPING TO WALL AND CAP.
5. REMOVE EXPOSED PIPING TO WALL AND CAP.
CEILING PLANS - SECOND FLOOR - LIBRARY CLASSROOMS

KEYED NOTES

1. EXISTING EXHAUST AIR DUCTWORK TO REMAIN FOR REUSE. REFER TO ARCHITECTURAL AND NEW WORK PLANS.
2. REMOVE EXISTING RETURN GRILLE. DUCTWORK TO REMAIN FOR RECONNECTION. REFER TO DEMO EXISTING SPRINKLER HEAD. EXISTING PIPING TO REMAIN FOR REUSE. REFER TO ARCHITECTURAL AND NEW WORK PLANS.
INSTALL NEW SINK AND REROUTE PLUMBING AND GAS PIPING AS REQUIRED FOR NEW ROUTE 1/2" G DOWN BELOW FLOOR. ROUTE PIPING ABOVE NEW CLASSROOM CEILING TO KEYED SWITCH. CONNECT TO EXISTING ROOM GAS SOLENOID. COORDINATE WITH PROVIDE NEW EMERGENCY SHOWER/EYEWASH STATION AND TEMPERING VALVE. ROUTE PIPING AS REQUIRED. REFER TO ARCHITECTURAL.

CONNECT NEW 2" VENT STACK FROM BELOW TO EXISTING STACK. INSULATE EXISTING STACK. CONNECT EXISTING GAS AND PLUMBING PIPING TO NEW FIXTURE AND GAS VALVE. EXTEND TEACHER'S STATION IN SCIENCE 3260.
CONNECT EXISTING PLUMBING PIPING TO NEW FIXTURE. EXTEND PIPING AS REQUIRED. REFER TO ARCHITECTURAL.

INSTALL NEW EMERGENCY WASHER STATION AND TEMPERINGVALVE PIPING AS INDICATED. REFER TO ARCHITECTURAL.

ROUTE 2" V FROM BELOW. ROUTE THROUGH CASEWORK AND CONNECT TO EXISTING VENT.

CONNECT EXISTING PLUMBING PIPING TO NEW FIXTURE. EXTEND PIPING AS REQUIRED. REFER TO ARCHITECTURAL.

ROUTE 2" V FROM BELOW. ROUTE THROUGH CASEWORK AND CONNECT TO EXISTING VENT.

KEYED NOTES

1. CONNECT EXISTING PLUMBING PIPING TO NEW FIXTURE. EXTEND PIPING AS REQUIRED. REFER TO ARCHITECTURAL.

2. INSTALL NEW EMERGENCY WASH/SHOWER STATION AND TEMPERING VALVE PIPING AS INDICATED. REFER TO ARCHITECTURAL.

3. INSTALL NEW EMERGENCY WASH/SHOWER STATION AND TEMPERING VALVE PIPING AS INDICATED. REFER TO ARCHITECTURAL.

4. ROUTE 2" V FROM BELOW. ROUTE THROUGH CASEWORK AND CONNECT TO EXISTING VENT.

5. CONNECT EXISTING PLUMBING PIPING TO NEW FIXTURE. EXTEND PIPING AS REQUIRED. REFER TO ARCHITECTURAL.

6. INSTALL NEW EMERGENCY WASH/SHOWER STATION AND TEMPERING VALVE PIPING AS INDICATED. REFER TO ARCHITECTURAL.

7. ROUTE 2" V FROM BELOW. ROUTE THROUGH CASEWORK AND CONNECT TO EXISTING VENT.

8. CONNECT EXISTING PLUMBING PIPING TO NEW FIXTURE. EXTEND PIPING AS REQUIRED. REFER TO ARCHITECTURAL.

9. INSTALL NEW EMERGENCY WASH/SHOWER STATION AND TEMPERING VALVE PIPING AS INDICATED. REFER TO ARCHITECTURAL.

10. ROUTE 2" V FROM BELOW. ROUTE THROUGH CASEWORK AND CONNECT TO EXISTING VENT.
BLANK OFF EXISTING PLENUM DIFFUSERS AND EXTEND PLENUM FROM EXISTING HEAT PUMP.

INSTALL NEW SPRINKLER HEADS IN NEW SUSPENDED CEILING DIFFUSERS.

INSTALLATION IN CENTER OF TILE.

EXTEND PIPING FROM EXISTING HEAT PUMP AND CONNECT NEW DUTY wikipedia.

REF. 12x10 SA

HP-128B

265 CFM
GENERAL ELECTRICAL NOTES

1. All work shall conform to the requirements of all applicable local, state, and national codes, as well as the specifications of this contract. All work shall be performed in a neat and workmanlike manner as specified in NECA 1.

2. All equipment, devices, cables, and conduits shall be installed using methods acceptable to the structural engineer and only with prior approval.

3. No loads shall be permitted to be hung from roof decking. All hangers shall be hung directly to the top member of structural steel or supplementary members acceptable to the structural engineer.

4. Surface wiremold shall be used on existing masonry walls; coordinate routing with engineer.

5. All existing equipment, fixtures, devices, etc. shown on the drawings are as accurate as possible. All work shall conform to the requirements of all applicable local, state, and national codes, as well as local utility requirements. Contractor shall coordinate with local code officials to determine if any code interpretations by code enforcement officials will impact their work.

6. Contractor shall coordinate their work with all trades prior to start of work.

7. Equipment wiring requirements.

8. Provide all required accessories and equipment for a complete operational system and planned work.

9. All GFCI-protected receptacles shall be accessible as required by local AHJ.

10. The project shall be coordinated with all trades prior to rough-in for clean installation. Recessed backboxes and conduit shall be used on free service for all equipment involved in their contract during the warranty period.

11. Provide O&M manuals for all systems and equipment to owner with within 30 days of final turnover.

12. Provide type-written panel directory on electrical panels. Handwritten text is not acceptable.

13. Provide wiring and connection for all telephone and data from the demarcation point(s) of the switchboard to the interior wiring distribution panel.

14. Coordinate locations of ceiling fixtures and devices with all trades. Align centerline of ceiling vacancy sensors, exhaust fans/overhead doors, equipment power connections, 208V power receptacles, 20A duplex power receptacles, 20A duplex GFI power receptacles, and motion sensors.

15. Test lighting systems to ensure proper coordination, adjustment, programming, and operation.

16. Design and construct all furring and cuts for the termination points of coordination to be worked out in consultation with the electrical engineer, lighting designer, and structural engineer.

17. Coordinate layout of panel directors on electrical panels. Main panel that is not accessible.

18. Coordinate layout of receptacles and switches to match the color scheme for architectural drawings.

19. Provide all built-in convenience outlets and convenience switches as specified in the electrical schedule.

20. Provide all hardware for all systems and equipment to be within 40 days of final completion.

21. All exposed conduit shall be flanged rated.

22. Coordinate locations of electrical devices and switches with all trades. Also center of visible recessed and surface lights.

23. Refer to panel schedules for coordination of devices shown on floor plans.

24. Contractor shall be responsible for coordinating the disconnecting and reconnecting of public addresses and fire alarm to the sprinkler panel within the panel locations shown. All work shall be coordinated with fire alarm and sprinkler.

25. Contractor shall coordinate the termination of all breakers shall be accessible as required by local AHJ.

26. All OSHA-protected receptacles shall be accessible as required by local AHJ.

27. All disconnect switches, controllers, control stations, and control devices shall be installed securely in a neat and workmanlike manner as specified in NECA 1.

28. Install conduit securely in a neat and workmanlike manner as specified in NECA 1.

29. Install hangers and supports as required to adequately and securely support electrical equipment. Coordination is a must. Use manufacturer’s recommended supports for panel units, mechanical equipment, or conduit.

30. Install conduit midway in wall and wrong hanging as specified in ne 31. Equipment connections make sure connections to equipment, manufacturer’s conduit,

32. Equipment wiring requirements.

33. Contractor’s electrical service shall be installed at the transformer in the areas specified in the electrical schedule.

34. All work shall be in accordance with the requirements of any Code Interpretation by Code Enforcement Official(s) as determined in the contract.

35. Projector device rough-in detail

36. Faceplate shall match material and color of other faceplates, to be confirmed by architect via insert. Faceplate shall use 4’x4”x3-1/2” square back box. Owner provided faceplate with cabling.
KEYED NOTES

1. REMOVE EXISTING BRANCH-WATER MAIN TO CONFORM TO ARCHITECTURAL.
2. REMOVE EXISTING DATA RECEPTACLE, REFER TO ARCHITECTURAL AND NEW WORK PLANS
   FOR NEW LOCATION.
3. REMOVE AND PROTECT BATTERY-OPERATED CLOCK FOR REINSTALLATION. COORDINATE
   FOR NEW LOCATION.
4. REMOVE EXISTING DATA RECEPTACLE. REFER TO ARCHITECTURAL AND NEW WORK PLANS.

REMOVE EXISTING RECEPTACLE. CIRCUITING TO REMAIN. COORDINATE WITH
ARCHITECTURAL AND NEW WORK PLANS.
RELOCATE EXISTING PROJECTOR CONNECTIONS. REFER TO ARCHITECTURAL AND NEW WORK PLANS.

REMOVE EXISTING RECEPTACLE AND PROVIDE STAINLESS STEEL BLANK PLATE OVER BOX. CIRCUITING TO REMAIN FOR CONNECTION TO NEW TOMBSTONE RECEPTACLE. REFER TO WORK PLANS.
Remove and salvage existing PA speaker cabling to remain for reuse. Refer to architectural and new work plans.

Remove associated power and A/V receptacles, conduit, and cabling for reinstallation. Coil network cabling at ceiling to be out of way of work.

Remove existing surface mount light fixture and casing. Circuiting to remain coordinate with architectural and new work plans.

Remove existing light switches. Refer to new work plans.

Remove associated power and A/V receptacles, conduit, and cabling.

Remove existing light fixtures. Refer to new work plans.

Some existing light fixtures refer to architectural and new work plans.
INSIDE NEW WALL. COORDINATE WITH ARCHITECTURAL ELEVATIONS.

PROVIDE NEW RECEPTACLE RECESSED IN WALL WITH FLUSH MOUNTED COVER PLATE.

CONNECT EXISTING NETWORK CABLING. NETWORK CABLING TO BE ROUTED IN CONDUIT.

CONNECT TO EXISTING CIRCUIT.

KEYED NOTES

1. PROVIDE NEW RECEPTACLE RECESSED IN WALL WITH FLUSH MOUNTED COVER PLATE
2. PROVIDE NEW RECEPTACLE RECESSED IN WALL WITH FLUSH MOUNTED COVER PLATE
3. PROVIDE NEW RECEPTACLE RECESSED IN WALL WITH FLUSH MOUNTED COVER PLATE
4. PROVIDE NEW POWER OUTLETS AND ALL DEVICES IN MAIN PRESENTATION BOARD LOCATIONS
   COORDINATE WITH ARCHITECTURAL ELEVATIONS. REFER TO DETAIL 4714.
1. PROVIDE POWERED GFCI MOUNTED ON FACE OF RAMP-U/P RECEPTACLE MOUNTED ON TABLETOP. CONNECT TO NEAREST RECEPTACLE CIRCUIT. REFER TO ARCHITECTURAL. COORDINATE WITH PROVIDE TOMBSTONE-STYLE BOX WITH (2) GFCI-PROTECTED DUPLEX RECEPTACLES CONNECT TO NEAREST RECEPTACLE CIRCUIT. REFER TO ARCHITECTURAL. COORDINATE WITH PROVIDE NEW GFCI-PROTECTED DUPLEX RECEPTACLE MOUNTED ON FACE OF CASEWORK. REFER TO ARCHITECTURAL.

4. PROVIDE POWER FOR EMERGENCY PUSH BUTTON AND KEYED SWITCH FROM NEAREST KEYED CIRCUIT. PROVIDE WIRING TO EXISTING BOX. REFER TO ARCHITECTURAL. COORDINATE WITH MECHANICAL.

5. PROVIDE POWERED GFCI MOUNTED ON FACE OF RAMP-U/P RECEPTACLE MOUNTED ON TABLETOP. CONNECT TO NEAREST RECEPTACLE CIRCUIT. REFER TO ARCHITECTURAL. COORDINATE WITH PROVIDE TOMBSTONE-STYLE BOX WITH (2) GFCI-PROTECTED DUPLEX RECEPTACLES CONNECT TO NEAREST RECEPTACLE CIRCUIT. REFER TO ARCHITECTURAL. COORDINATE WITH PROVIDE NEW GFCI-PROTECTED DUPLEX RECEPTACLE MOUNTED ON FACE OF CASEWORK. REFER TO ARCHITECTURAL.

6. PROVIDE POWER FOR EMERGENCY PUSH BUTTON AND KEYED SWITCH FROM NEAREST KEYED CIRCUIT. PROVIDE WIRING TO EXISTING BOX. REFER TO ARCHITECTURAL. COORDINATE WITH MECHANICAL.

7. PROVIDE POWER FOR EMERGENCY PUSH BUTTON AND KEYED SWITCH FROM NEAREST KEYED CIRCUIT. PROVIDE WIRING TO EXISTING BOX. REFER TO ARCHITECTURAL. COORDINATE WITH MECHANICAL.
CEILING PLANS - SECOND FLOOR - LIBRARY CLASSROOMS

INSTALL NEW PA SPEAKER (FURNISHED BY OWNER). PROVIDE CABLING TO BUILDING PA SYSTEM.
REINSTALL SALVAGED PA SPEAKER. EXTEND CABLING AS REQUIRED.
INSTALLATION WITH OWNER.

PROVIDE CEILING-MOUNTED DATA RECEPTACLE FOR WIRELESS ACCESS POINT. COORDINATE CONNECT NEW LIGHT FIXTURES IN THIS ROOM TO EXISTING LIGHTING CIRCUIT. SYSTEM. COORDINATE REQUIREMENTS WITH OWNER.

1/4" = 1'-0"