HURST-ROSCHE, INC.

PROJECT MANUAL FOR

INTERIOR RENOVATIONS AND ASBESTOS ABATEMENT
SANDOVAL ELEMENTARY SCHOOL
SANDOVAL C.U.S.D. NO. 501
SANDOVAL, MARION COUNTY, ILLINOIS
HR # 150-3600

Prepared for

Sandoval C.U.S.D. No. 501
859 West Missouri Avenue
Sandoval, Marion County, Illinois

FEBRUARY 22, 2021

Bid Package No. _____

HURST – ROSCHE INC.
1400 E. Tremont Street Hillsboro, Illinois 62049 217 / 532-3959

DOCUMENT 00 01 10

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Sandoval Elementary School
Sandoval CUSD 501
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SPECIFIERS:

ASBESTOS: Michael E. Emken

Michael E. Emken

IDPH License No. 100-10660
Expires: May 15, 2021

ARCHITECTURAL: Timothy L. Downen, AIA, LEED AP

LICENSED ARCHITECT
TIMOTHY L
DOWNEN
001.021928
STATE OF ILLINOIS

Expires: 11-30-2022

END OF SECTION

DOCUMENT 00 11 16

INVITATION TO BID

Project: **INTERIOR RENOVATIONS AND ASBESTOS ABATEMENT**
SANDOVAL ELEMENTARY SCHOOL
SANDOVAL C.U.S.D. NO. 501
HR# 150-3600

Owner: **SANDOVAL C.U.S.D. NO. 501**
859 W. MISSOURI AVE.
SANDOVAL, ILLINOIS 62882

Architect/Engineer: **HURST-ROSCHE, INC.**
1400 E. TREMONT STREET
HILLSBORO, ILLINOIS 62049

Date: **February 22, 2021**

The Owner will receive Bids until 2:00 PM local prevailing time on Thursday the 11th day of March, 2021, at SANDOVAL C.U.S.D. NO. 501, 859 W. MISSOURI AVE., SANDOVAL, ILLINOIS 62882 for the following work:

Project description:

BASE BID consists of the abatement of approximately 1,850 square feet of carpet covered asbestos containing floor tile and mastic, including carpet and associated mastic under full containment methods, the abatement of 140 square feet of double layer asbestos containing floor tile and mastic under full containment methods and the abatement of approximately 2,770 square feet of single layer asbestos containing floor tile and mastic by infrared heat removal methods. Removal of all associated wall base material is commensurate with the work. The work also contains interior renovations necessary for the creation of new administrative offices within an existing classroom, including demolition, new metal stud and gypsum board partitions, new vinyl tile and carpet tile flooring and rubber base (to replace a portion of removed asbestos containing flooring materials – the balance of new flooring will be provided and installed by others under separate contract), new suspended acoustical panel ceilings, new paint and new casework. Mechanical and electrical work is commensurate with the renovation.

ALTERNATE BID #1 consists of the abatement of approximately 815 square feet of double layer asbestos containing floor tile and mastic under full containment methods. Removal of associated wall base material is commensurate with the work. The work also includes new vinyl tile flooring and rubber wall base materials (to replace a portion of the removed asbestos containing flooring materials - the balance of new flooring will be provided and installed by others under separate contract).

A Pre-bid Meeting will be held on Tuesday, the, 2nd day of March, 2021, at 10:00 AM, prevailing time, at SANDOVAL ELEMENTARY SCHOOL, 300 EAST PERRY, SANDOVAL, ILLINOIS 62882.

Drawings and specifications may be obtained at the office of Hurst-Rosche, Inc., 1400 E. Tremont Street, Hillsboro, Illinois, after February 22, 2021, by paying a non-refundable amount of $50.00 ($60.00 if mailed) for each set of drawings and specifications.

Bidding Documents, Drawings and Specifications, may be examined by prospective bidders and material suppliers at the offices of Hurst-Rosch, Inc., 1400 E. Tremont St., Hillsboro, Illinois, and the following Plan Rooms:

Central Illinois Plan Room, 1620 S. 5th Street, Springfield, IL 62703
Greater Peoria Contractors & Suppliers Association, 1811 West Altorfer Drive, Peoria, IL 61615
McGraw Hill Construction, www.dodgeprojects.construction.com
Southern Illinois Builders Association, 1468 Green Mount Road, O'Fallon, IL 62269

Drawings and specifications will be available for viewing on the internet at: www.hurst-rosche.com. The documents are being provided for reference purposes only. Bidders are encouraged to obtain a signed and sealed hard copy set of the bidding documents. At a minimum, bidders must obtain clean copies of bid forms from the offices of Hurst-Rosche, Inc. by paying a non-refundable amount of $10.00 to submit a bid for this project.

The Owner requires the project to be substantially complete by August 6, 2021.

Bidders will be required to provide Bid security of a sum no less than 10 percent of the Bid Sum. The bid security shall be either certified check, cashier's check, bank money order or bid bond issued by surety licensed to conduct business in the State of Illinois. Hereinafter this bid security shall be referred to as the bid bond.

Submit two copies of your Bid on the Bid Form provided. Bidders may supplement this form as appropriate.

Your Bid will be required to be submitted under a condition of irrevocability for a period of 30 days after submission.

Successful bidders shall be required to observe Illinois Public Act 77-1552 and the Illinois Department of Human Rights and Illinois Human Rights Commission Rules pertaining to Equal Employment Opportunity as provided for in paragraphs 2-101, et seq., Article II, Chapter 68, of the Illinois Revised Statutes; and comply with paragraph 271 of Chapter 48 of the Illinois Revised Statutes concerning the employment of citizens of the State of Illinois; and comply with Chapter 48, Sections 39s-1 through 39s-12, of the Illinois Revised Statutes, as amended, known as the Prevailing Wage Determination, as issued by the Illinois Department of Labor.

The Owner reserves the right to accept or reject any or all Bids or any part thereof, to waive any informality in bidding, and to accept bids deemed most favorable to the Owner.

Sandoval C.U.S.D. No. 501

ROB MILLER, SUPERINTENDENT

END OF DOCUMENT

DOCUMENT 00 21 14

INSTRUCTIONS TO BIDDERS - AIA

1.1 SUMMARY

A. Document Includes:
1. Instructions to Bidders.
2. Site examination.
3. Prebid conference.

B. Related Documents:
1. Document 00 11 16 - Invitation To Bid.
2. Document 00 41 13 - Bid Form - Stipulated Sum.
3. Document 00 43 00 - Procurement Form Supplements: Appendices A and B.
4. Document 00 72 14 - General Conditions – AIA Stipulated Sum.
5. Document 00 73 13 - Supplementary Conditions – AIA.

1.2 INSTRUCTIONS TO BIDDERS

A. These Instructions to Bidders amend or supplement AIA Document A701-1997 - Instructions to Bidders and other provisions of Bidding Documents and Contract Documents.

B. To be considered all bids must in accordance with these Instructions to Bidders.

C. Those interested parties may obtain sets of Drawings and Specifications from the Architects upon non-refundable amount of $50.00 per set ($60.00 if mailed).

D. At a minimum, bidders must obtain clean copies of bid forms from the offices of Hurst-Rosche, Inc. by paying a non-refundable amount of $10.00 to submit a bid for this project.

1.3 SITE EXAMINATION

A. Bidders shall carefully examine documents and construction site to obtain first-hand knowledge of existing conditions. Contractors will not be given extra payments for conditions which can be determined by examining site and these documents.

B. Contact Owner at the following address and phone number to arrange date and time to visit Project site:
1. Address: 859 W. Missouri Ave., Sandoval, Illinois
2. Telephone: 618-247-3361.

1.4 THE SCHEDULE FOR BIDDING THIS PROJECT IS AS FOLLOWS

A.	**Plans Available:**	**February 22, 2021**
B.	**Pre-Bid Meeting:**	**March 2, 2021** **10:00 AM** **859 W. Missouri Ave.** **Sandoval, Illinois**
C.	**Latest Time to Submit Request for Interpretation:**	**March 4, 2021**
D.	**Latest Time to Issue an Addendum:**	**March 8, 2021**
E.	**Bid Opening**	**March 11, 2021** **2:00 PM** **859 W. Missouri Ave.** **Sandoval, Illinois**

F. All requests for interpretations shall be in writing via mail or e-mail addressed to the Architect/Engineer and must be received by the date and time identified in Article 1.4 of this section in order to be given consideration. All questions must be submitted on the "Request for Interpretation Pre-Bid Question and Comment Form" included at the end of this section, and questions not submitted in accordance with this form and specified time frame will not be accepted. Any and all interpretations and supplemental instructions will be made by addendum to the Drawings and Specifications and forwarded to all bidders either by certified mail or e-mail. All responses by the Architect/Engineer must be in writing to be binding. Any response general in nature or affecting these Instructions to Bidders shall be sent via addendum as previously described. All bidders are required to return the signature page of the addendum signed to the Architect within 24 hours after receipt. Failure of any bidder to receive any such addendum or interpretations shall not relieve such bidder from an obligation under the bid as submitted. All addenda so issued shall become part of the Contract Documents. No addendum will be issued later than the date and time identified in Article 1.4 of this section except one withdrawing the request for Bids or one postponing date for receiving Bids. Oral interpretations, changes or corrections will not be binding and Bidders shall not rely upon such interpretations, changes and corrections. Each Bidder shall ascertain prior to submitting Bid that all addenda issued have been received and shall acknowledge receipt in Bid.

Questions shall be directed to:
e-mail: tdownen@hurst-rosche.com

G. Materials, products and equipment described in Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution. No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least ten days prior to the date for receipt of Bids. Each such request shall include name of material or equipment for

which it is to be substituted and a complete description of the proposed substitute including drawings, cuts, performance and test data and any other information necessary for an evaluation. A statement setting forth any changes in other materials, equipment or other work that incorporation of the substitute would require shall be included. The burden of proof of the merit of proposed substitute is upon the proposer. Architect's decision of approval or disapproval of a proposed substitution shall be final. If the Architect approves any proposed substitution prior to receipt of Bids, such approval will be set forth in an addendum. Bidders shall not rely upon approvals made in any other manner. No substitutions will be considered after the contract award unless specifically provided in the Contract Documents.

H. Bids shall be made on unaltered Bid Forms furnished by the Architect. Fill in all blank spaces and submit two (2) copies. Bids shall be signed with name typed below signature. Where bidder is a corporation, bids must be signed with legal name of corporation followed by name of state of incorporation and legal signature of an officer authorized to bind the corporation to a contract.

I. Each bidder submitting a bid shall submit on form provided a list of any subcontractors and major suppliers he proposes to use with the bid. Failure to do so could disqualify the bid.

J. Each bidder shall designate on the attached bid form one person who shall serve as the bidder’s contact person for all matters pertaining to the bid. In absence of such designation, the person who signs the bid shall be deemed the bidder contact.

K. Each bid shall be accompanied by bid bond made payable to the Owner, in the amount of ten percent (10%) of the bid sum. Security shall be either certified check, cashier's check, bank money order or bid bond issued by surety licensed to conduct business in the State of Illinois. Successful bidder's security will be retained until he has signed the contract and furnished required payment and performance bonds. Owner reserves the right to retain security of the next two (2) lowest bidders until the lowest bidder enters into contract or until thirty (30) days after bid opening, whichever is shorter. All other bid security will be returned as soon as practicable. If any bidder refuses to enter into a contract, Owner will retain bid security as liquidated damages, but not as a penalty.

L. All costs associated with the preparation and submission of a bid are the sole responsibility of the bidder. These costs shall not be chargeable to the Owner by any successful or unsuccessful bidder. All bids become the property of the Owner and shall not be returned except in the case of a late submission.

M. Simultaneously, with delivery of the executed contract, the successful bidder, at its own expense, shall furnish surety in the form of a performance bond and a labor and material payment bond in the amount of one hundred percent (100%) of the contract amount. Surety for such bonds shall be a company duly authorized and licensed in the State of Illinois and acceptable to the Owner. The Attorney-In-Fact who signs bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

N. All copies of the bid, bid security and any other documents required to be submitted with bid shall be enclosed in a sealed opaque envelope. Envelope shall be addressed to SANDOVAL C.U.S.D. NO. 501, 859 W. MISSOURI AVE., SANDOVAL, ILLINOIS 62882, and shall be identified with project name, bidder's name and address. Mailed bid envelopes shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof. Oral, telephonic or telegraphic Bids are invalid and will not receive consideration. Bids shall be deposited at the location designated in the Invitation to Bid prior to time and date designated for opening, or any extension thereof made by addendum. Bidder shall assume full responsibility for timely delivery at location designated for receipt of Bids. Bids received after time and date for receipt of bids will be returned unopened.

O. A bid may not be modified, withdrawn or canceled during the thirty (30) days immediately following bid opening, and each bidder so agrees in submitting his Bid. Any bidder may withdraw, cancel or modify its bid, at any time prior to scheduled time for opening of bids, by letter or telegram actually received by Owner prior to bid time, or, with proper identification, by personally securing bid submitted; if by telegram, written confirmation over signature of bidder shall be mailed and postmarked on or before date and time of bid opening. Withdrawn bids may be resubmitted up to bid opening time provided that they are in full compliance with these Instructions to Bidders.

P. Protests

1. Any bidder who submitted a bid and believes the bid was improperly rejected or that the bid selected by the Owner is not in the best interest of the Owner may submit a written notice of intent to protest the bid to the Owner within seven (7) days. The Owner shall consider all protests before execution of a contract. Each protest must specify the reasons supporting the protest. The Owner may require that additional information be provided. Failure to supply such required information shall be cause for dismissal of the protest.
2. The Owner shall immediately investigate the allegations against the Owners actions and shall issue a written response to the protest.
3. This provision allowing for the submission of protest shall not confer any right on any bidder but is intended solely to assist the Owner in determining the best responsible bid.

Q. Any complaint or protest of the bidding procedure must be filed by the bidder to the Owner. Within 7 days of bid opening the bidder shall notify the Owner in writing of his intent to protest bidding. The bidder shall perfect this notice of intent within 7 days.

R. Owner reserves right to disqualify bids and bidders, before or after opening, upon evidence of collusion with intent to defraud or other illegal practices upon part of bidder, lack of responsibility as evidenced by poor workmanship and progress of past work, incomplete work which, in judgment of Owner, might hinder or prevent prompt completion of additional work if awarded, for being in arrears on existing contracts, in litigation with the Owner, or having defaulted on a previous contract.

S. Bidder's attention is directed to the fact that all Federal and Illinois State Laws, municipal ordinances and regulations of any and all authority having jurisdiction over construction

of the project shall apply to the contract throughout, and they will be deemed to be included in the contract the same as though herein written out in full. Successful Bidders shall be required to observe Illinois Public Act 77-1552 and the Illinois Department of Human Rights and Illinois Human Rights Commission Rules pertaining to Equal Employment Opportunity, as provided for in Paragraphs 2-101, et seq., Article II, Chapter 68, of the Illinois Revised Statutes; Paragraph 271 of Chapter 48 of the Illinois Revised Statutes concerning the employment of citizens of the State of Illinois; and Chapter 48, Sections 39S-1 through 39S-12, of the Illinois Revised Statutes, as amended, known as the Prevailing Wage Determination, as issued by the Illinois Department of Labor.

T. Owner is exempt from payment of Federal & Illinois Department of Revenue's Use and Sales Tax on material entering permanently into structure. Retail sales tax shall not be included in the bid amount.

U. Bids will be opened as announced in Invitation for Bids.

V. Owner reserves the right to reject any or all bids or any part thereof, to waive any informalities in bidding and to accept bids deemed most favorable to the Owner.

W. Notwithstanding any delay in preparation and execution of the formal Contract Agreement, each bidder shall be prepared, upon written notice of bid acceptance, to commence work within ten (10) days following receipt of official written Notice to Proceed, or on date stipulated in such notice.

X. Any work in providing or preparing to provide the services specified herein that is commenced by the successful bidder prior to execution of a written contract agreement shall be at the bidder's expense.

Y. Accepted bidder shall assist and cooperate with the Owner in preparing the formal Contract Agreement, and, within fifteen (15) days following its presentation, shall execute same and return it to Owner.

1.5 REQUIRED CONTRACTOR/SUBCONTRACTOR BACKGROUND SCREENING

A. Sandoval C.U.S.D. No. 501 requires background screening to be completed on all contractor/subcontractor employees. All employees must have documentation that a background screening has been completed on them prior to working on any district projects. All costs associated with the background screening are to be the responsibility of the contractor.

B. All contractor/subcontractor employees working on the school grounds of Sandoval C.U.S.D. No. 501 are required to submit to Background Screening. Each employee must complete, sign, and date the Consent and Waiver Release form. These forms will be submitted and the applicant cleared before the applicant may work on any part of the school grounds.

C. All information received as a result of a background check will be strictly confidential. After the screenings, the Contractor is responsible for sending Sandoval C.U.S.D. No. 501 copies of approved background checks for their records.

END OF DOCUMENT

Hurst-Rosche, Inc. E-Mail: tdownen@hurst-rosche.com

REQUEST FOR INTERPRETATION PRE-BID QUESTION AND COMMENT FORM

(All information entered shall be typed in black).

PROJECT NAME: INTERIOR RENOVATIONS AND ASBESTOS ABATEMENT - SANDOVAL ELEMENTARY SCHOOL

BIDDER: SUBMITTED BY (Name): Date:

ADDRESS: CITY: STATE: PHONE: Sheet of

Question No.	Page (or Drawing Sheet) Number	Drawing No. or Spec. Section Article & Paragraph Number	Question by Bidder

NOTE: ***ANY AND ALL QUESTIONS PERTAINING TO THIS BID MUST BE TYPED AND SUBMITTED ON THIS FORM AND MAILED OR E-MAILED TO RECEIVE A RESPONSE.***

END OF SECTION 002114.

DOCUMENT 00 41 13

BID FORM - STIPULATED SUM

To: **SANDOVAL C.U.S.D. NO. 501**
859 W. MISSOURI AVE.
SANDOVAL, ILLINOIS 62882

Project: **INTERIOR RENOVATIONS AND ASBESTOS ABATEMENT**
SANDOVAL ELEMENTARY SCHOOL
SANDOVAL C.U.S.D. NO. 501
HR # 150-3600

Date: _____

Submitted by: _____
(full name)

(full address) _____
_____
_____

Contact Name: _____

1. OFFER

Having examined the Place of The Work and all matters referred to in the Instructions to Bidders and the Contract Documents prepared by the Architect for the above mentioned project, we, the undersigned, hereby offer to enter into a Contract to perform the Work for the Sum of _____ Dollars ($_____), in lawful money of the United States of America.

We have included the bid security as required by the Instruction to Bidders.

All applicable federal taxes are excluded and State of Illinois and City of Sandoval taxes are excluded from the Bid Sum.

2. REVIEW OF BID DOCUMENTS

The bidder represents that he is skilled and experienced in the use and interpretation of drawings and specifications such as those included in the bid documents for this contract. He has carefully reviewed the drawings, specifications and other bid documents, and has found them free of ambiguities and sufficient for bid purposes. Further, the Bidder has carefully examined the site of the work and, from his own observations, has satisfied himself as to the nature and location of the work; the character, quality and quantity of materials; the difficulties likely to be encountered; and any other items which may affect the performance of the Work. He has based his bid solely on these documents and observations, and has not relied in any way on any explanation or interpretation, oral or written, from any other source.

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3. CONTRACTOR'S FEE FOR CHANGES IN WORK

Undersigned herein indicates a single percentage, not to exceed 12% for own forces and not to exceed 8% for subcontractors, for overhead and profit to be added to net extra job cost for changes in the work required to be performed by:

a) Own Forces ____% b) Subcontractors ____%

Undersigned herein indicates a single percentage, not less than 10% for own forces and not less than 5% for subcontractors, for overhead and profit to be added to net credit for job costs for changes in the work required to be performed by:

a) Own Forces ____% b) Subcontractors ____%

Percentages named above shall not include any items of insurance, bond or taxes since these are considered job cost items in contractor's quotations for changes in the work.

Any percentages indicated which are higher or lower than the maximum or minimum in the typewritten language herewith, shall be disregarded and typewritten figure used.

4. CONTRACT TIME

Undersigned agrees that, if awarded the Contract for Work bid upon herein, work will start on date designated in a written Notice to Proceed order issued by the Architect and will be completed in accordance with the contract documents, with all phases of work completed and operational and ready for acceptance by the Owner no later than as required by the Contract Agreement.

5. ADDENDA

The following Addenda have been received. The modifications to the Bid Documents noted below have been considered and all costs are included in the Bid Sum.

Addendum # _____ Dated _____; Addendum # _____ Dated _____
Addendum # _____ Dated _____; Addendum # _____ Dated _____

6. APPENDICES

The following documents are attached to and made a condition of the Bid:

Bid Surety in the form of _____
Document 004300 - Procurement Form Supplements including:
Appendix A - List of Subcontractors.
Appendix B - List of Alternates.

7. EQUAL EMPLOYMENT OPPORTUNITY

During performance of this contract, Contractor agrees as follows:

a. The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated

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during employment, without regard to their race, color, religion, sex or national origin. Such action shall include, but not be limited to, the following: Employment, upgrading, demotion, or transfer, recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of this nondiscrimination clause.

b. The contractor will in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin.

c. The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract of understanding, notice advising the labor union or worker's representative of the contractor's commitments under Section 202 of Executive Order 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

d. The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and by the rules, regulations, and relevant orders of the Secretary of Labor.

e. The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by the rules, regulations, and order of the Secretary of Labor pursuant thereto, and will permit access to his books, records and accounts by the Department of the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations and orders.

f. In the event of the contractor's non-compliance with the nondiscrimination clauses of this contract or with any such rules, regulations or orders, this contract may be canceled, terminated or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies involved as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation or order of the Secretary of Labor, or as otherwise provided by law.

g. The contractor will include the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the Department may direct as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that in the event the contractor becomes involved in, or is threatened with, litigation with the subcontractor or vendor as a result of such direction by the Department, the contractor may request the United States to enter into such litigation to protect the interest of the United States.

8. NOT BARRED

The contractor by submitting its bid certifies that the Contractor is not barred from bidding on the contract as a result of a conviction for either bid-rigging or bid-rotating. 720 ILCS 5/33/E-11.

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9. DRUG FREE WORKPLACE

The Contractor by submitting its bid certifies that it will provide a drug free workplace and that it is in compliance with the requirements of the Drug Free Workplace Act 30 ILCS 580.1 et. seq., and the Substance Abuse Prevention on Public Works Projects Act PA095-0635.

10. SEXUAL HARASSMENT POLICY

The Contractor by submitting its bid certifies that it has a written sexual harassment, (ii) a description of sexual harassment, utilizing examples; (iv) an internal complaint process including penalties (v) the legal resource, investigative and compliant process through the Illinois Department of Human Rights: (vi) directions on how to contact the Department and Commission; and (vii) protection against retaliation for exercising rights under the policy in accordance with 775 ILCS 5/2-105(A)(4).

11. CRIMINAL RECORDS CHECKS

The Contractor by submitting its bid certifies that it will submit to background screening those employees, including subcontract employees, which will be working on any district project. This information is to be provided in accordance with the requirements of 105 ILCS 5/10-21.9. The Contractor by submitting its bid understands that employees found to be in violation of the Illinois School Code will not be permitted to work on school grounds.

12. BID FORM SIGNATURES

The Corporate Seal of

_____
(Bidder - print the full name of your firm)
was hereunto affixed in the presence of:

_____
(Authorized signing officer Title)

(Seal)

_____
(Authorized signing officer Title)

(Seal)

If the Bid is a joint venture or partnership, add additional forms of execution for each member of the joint venture in the appropriate form or forms as above.

END OF DOCUMENT

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DOCUMENT 00 43 00

PROCUREMENT FORM SUPPLEMENTS

To: **SANDOVAL C.U.S.D. NO. 501**
859 W. MISSOURI AVE.
SANDOVAL, ILLINOIS 62882

Project: **INTERIOR RENOVATIONS AND ASBESTOS ABATEMENT**
SANDOVAL ELEMENTARY SCHOOL
SANDOVAL C.U.S.D. NO. 501
HR # 150-3600

Date: _____

Submitted by: _____
(full name)

(full address) _____
_____
_____

Contact Name: _____

In accordance with Document 00 21 14 - Instructions to Bidders - AIA and Document 00 41 13, we include the Appendices to Bid Form Supplements listed below. The information provided shall be considered an integral part of the Bid Form.

The following Appendices are attached to this document:

Appendix A - List of Subcontractors: Include names of all Subcontractors and portions of the Work each Subcontractor will perform.

Appendix B - List of Alternates: Include cost variation to Bid Sum applicable to the Work described in Section 012000-Price and Payment Procedures.

BID FORM SUPPLEMENTS SIGNATURES

The Corporate Seal of

_____
(Bidder - print the full name of your firm)

was hereunto affixed in the presence of:

_____
(Authorized signing officer Title) (Seal)

_____
(Authorized signing officer Title)

DO NOT COPY

APPENDIX A - LIST OF SUBCONTRACTORS

Herewith is the list of subcontractors referenced in the bid submitted by:

(Bidder) _____

To (Owner) **SANDOVAL C.U.S.D. NO. 501**
859 W. MISSOURI AVE.
SANDOVAL, ILLINOIS 62882

Dated _____ and which is an integral part of the Bid Form.

The following work will be performed (or provided) by subcontractors and coordinated by us:

WORK SUBJECT	NAME
Access Control	Security Alarm Corp.
Fire Alarm	Security Alarm Corp.
Security Camera	Security Alarm Corp.
Asbestos	
Electrical	
Mechanical	
Doors / hardware	
Flooring	
Ceilings	
Walls / partitions	

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APPENDIX B - LIST OF ALTERNATES

The following is the list of alternates referenced in the bid submitted by:

(Bidder) _____

To (Owner) SANDOVAL C.U.S.D. No. 501

Dated _____ and which is an integral part of the Bid Form.

The following amounts shall be added to or deducted from the Bid Sum. Refer to Section 012000 - Price and Payment Procedures: Schedule of Alternates for description of alternates.

Alternate # 1 (Add) $ _____

END OF DOCUMENT

DO NOT COPY

DOCUMENT 00 52 14

AGREEMENT FORM - AIA

1.1 SUMMARY

A. Document Includes:
1. Contract Agreement.

B. Related Documents:
1. Document 00 72 14 - General Conditions – AIA Stipulated Sum.
2. Document 00 73 13 - Supplementary Conditions - AIA.

1.2 CONTRACT AGREEMENT BETWEEN OWNER AND CONTRACTOR

A. THIS AGREEMENT, made and entered into as of the _____ day of _____ in the year of Two Thousand and _____by and between _____ hereinafter and in the Contract Documents called "Contractor" and the SANDOVAL C.U.S.D. NO. 501, hereinafter and in the Contract Documents called "Owner."

B. WITNESSETH: That for and in consideration of the mutual covenants and agreements, hereinafter stated, Contractor and Owner covenant and agree as follows:

C. THE CONTRACT WORK:

1. Contractor covenants and agrees to furnish all labor, materials, equipment, transportation, construction plant and facilities necessary to perform all Work required by the Contract Documents, for the Project entitled:

a. INTERIOR RENOVATIONS AND ASBESTOS ABATEMENT
SANDOVAL ELEMENTARY SCHOOL
SANDOVAL C.U.S.D. NO. 501

as shown on Drawings and described in Specifications prepared by Hurst-Rosche, Inc., 1400 E. Tremont St., Hillsboro, Illinois 62049, acting as, and in these Contract Documents referred to as Architect/Engineer and covenants and agrees to do and perform all acts and things required of Contractor by this Contract and the Contract Documents.

D. CONTRACT SUM AND TERMS OF PAYMENT:

1. Contract Sum: The Owner, if Contractor shall faithfully fulfill and perform this Contract, covenants and agrees to pay Contractor in current funds, subject to additions and deductions by Change Order as provided in the Contract Documents, the sum of _____Dollars ($_____), which sum shall constitute the Contract Sum, said Contract Sum being derived from Contractor's Bid dated _____. It is understood and agreed that should there be any increase in wage rates, or in cost of materials or equipment, or in any other of Contractor's costs or should Contractor be compelled to pay premium wages, or for overtime work, during the life of this Contract and/or prior to completion of Contractor's work thereunder,

Contractor shall absorb all such increased costs, without addition to the Contract Sum except when otherwise expressly provided in Contract Documents.

2. Payments: Owner shall make payments for work performed under the Contract as provided in Article Nine of the General Conditions and in accordance with other applicable articles of the Supplementary Conditions and Contract Documents.

3. Contractor's Fees for Changes in Work: In accordance with Contractor's bid, it is agreed that the following percentages for overhead and profit shall be applied on work added to or omitted from the Contract by written Change Order approved by Architect and Owner in advance of performance of the work.

Additional Work performed by:

1. Own Forces ____% 2. Subcontractors ___%

Omitted Work originally required by:

1. Own Forces ____% 2. Subcontractors ____%

E. CONTRACT DOCUMENTS:

1. Contract Documents include the Contract Agreement, Contractor's Bid as accepted by Owner, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, and all Addenda issued prior to and all Modifications issued after execution of the Contract Agreement.

F. ILLINOIS LABOR:

Contractor shall comply with all Illinois statutory requirements regarding labor, including, but not limited to, the following:

1. Illinois Public Act 77-1552 and Chapter 48, Sections 39S-1 through 39S-12 of the Illinois Revised Statutes regulating wages of laborers, mechanics and other workers employed in any public works and known as the "Prevailing Wage Act," which provides in part that all laborers, mechanics and workers performing work under the Contract shall be paid not less than the prevailing rate of wages as determined by the Illinois Department of Labor.

2. Illinois Public Act 83-1472, Article 2 and Chapter 48, Sections 2201 through 2207, 1984 of the Illinois Revised Statutes pertaining to hiring of Illinois labor and known as the "Illinois Preference Act."

3. "Illinois Human Rights Act of 1980," Chapter 68, Illinois Revised Statutes, and the Rules and Regulations, Title 44, Section 750 of the Illinois Administrative Code, Illinois Department of Human Rights; pertaining to equal employment opportunity.

G. PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND:

1. Within ten (10) days immediately following date of his receipt of this contract, Contractor shall furnish Owner the signed Contract and Performance Bond and Labor and Material Payment Bond as required by and in accordance with the terms of Contract Documents in a penal sum of one hundred percent (100%) of the Contract sum.

2. In the event Contractor fails to furnish Owner such Contract and Bonds within said period, this Contract shall thereupon become null and void at Owner's option, exercised by written registered notice and mailed to Contractor by said Owner within five (5) days thereafter. Owner may then retain and enforce as liquidated damages, bid guarantee heretofore deposited with it in connection with Contractor's proposal for this Contract or the difference between his bid and a subsequent awarded bid, whichever is lesser.

H. IN WITNESS HEREOF, the parties hereto have executed this agreement as of the day and year first written above.

OWNER:

SANDOVAL C.U.S.D. NO. 501

BY_____

TITLE_____

CONTRACTOR:

_____

BY_____

TITLE_____

Attest:

BY_____
Secretary

(Corporate Seal)

END OF DOCUMENT

CONTRACTOR'S AFFIDAVIT FOR FINAL COMPLETION
(To be filed with final request for payment)

STATE OF_____)

COUNTY OF _____)

_____, being first duly sworn upon oath deposes and says:

That he/she is _____ of _____
_____

hereinafter termed "The Contractor" for all work upon the hereinafter termed "Said Project," work for the SANDOVAL C.U.S.D. NO. 501, under that certain contract between said Contractor and said Owner, bearing date of _____ pertaining to said work.

Affiant further states, of his/her own knowledge, that all bills incurred by the Contractor, for services, labor and material furnished, for work done by the Contractor under said Contract, or in connection with said project have been paid and all subcontractors who have furnished services, labor or materials have no claim or demand against Owner for any services, labor and/or materials furnished and/or work done by them upon said Project.

Affiant further states that this affidavit is made on behalf of the Contractor for the purpose of obtaining payment of the sum of _____($_____) dollars, which affiant states, upon his/her own knowledge, constitutes the full balance due the Contractor for all services, labor and materials furnished and work done to and upon Said Project by the Contractor whether under and pursuant to provisions of said Contract and all subsequent modifications thereof and changes therein or otherwise; and that payment of the sum to the Contractor will constitute payment in full on everything due for such services, labor, materials and work, and will fully satisfy any and all claims or demands which Contractor may have or assert against said Owner, arising out of anything done or furnished by the Contractor or occurring in connection with said Project and/or Contract.

_____
CONTRACTOR

By _____

Title _____

Subscribed and Sworn to before me the _____ day of_____, 20____.

_____
NOTARY PUBLIC

(PARTIAL) (FINAL)
WAIVER OF LIEN

STATE OF _____
}SS
COUNTY OF _____

TO WHOM IT MAY CONCERN:

WHEREAS the undersigned has been employed by SANDOVAL C.U.S.D. NO. 501, hereinafter known as the OWNER,

To Furnish: _____

For the project known as: INTERIOR RENOVATIONS AND ASBESTOS ABATEMENT

For the premises known as: SANDOVAL ELEMENTARY SCHOOL

Address: SANDOVAL C.U.S.D. NO. 501, SANDOVAL, ILLINOIS

THE undersigned, for and in consideration of the dollar amount shown below and other good and valuable considerations, do(es) hereby waive and release under the mechanics' lien statutes of the State where the project premises are located, to the extent of the payment recited below is received by the undersigned and is applicable to lienable labor, services, materials, fixtures, or apparatus, any and all lien or claim or right of lien on the above-described premises and the improvements, fixtures and appurtenances thereon, and on the monies or other considerations due or to become due from the Owner and on all other project-related monies from whatever source, on the account of the above-mentioned labor, services, materials, fixtures, or apparatus furnished by the undersigned for or in connection with the above-described premises.

_____
(Payment amount written in long form)

PAYMENT AMOUNT _____

_____
(Company Name)

_____
(Address)

_____
(City/State/Zip)

_____
(Signature of Officer)

Sworn to and subscribed before me this _____ day of _____.

(Notary Public)

My commission expires: _____

RYAFFIDAVIT OF PAYMENT TO MATERIAL SUPPLIERS AND SUBCONTRACTORS

STATE OF _____

COUNTY OF _____

_____, being first duly sworn upon oath deposes and says, that he/she entered into a Contract with the SANDOVAL C.U.S.D. NO. 501, known as the Owner, for furnishing of labor, work services, materials, fixtures, and supplies for INTERIOR RENOVATIONS AND ASBESTOS ABATEMENT at the following described real estate: SANDOVAL ELEMENTARY SCHOOL.

That for the purpose of said Contract, the following persons, firms or corporations have been contracted with to furnish, have furnished or prepared, or will furnish or prepare labor, services, materials, fixtures, apparatus, machinery or supplies, or are furnishing and preparing material for said construction; that there are due or to become due to them respectively, the amounts set opposite their names for said labor, services, materials, fixtures, apparatus, machinery and supplies as stated; that there are no other contractors outstanding and there is nothing due or to become due any person, firm, or corporation, for labor, services, materials, fixtures, machinery, apparatus, or supplies, other than as stated herewith.

MATERIAL SUPPLIER AND/OR SUBCONTRACTOR	CONTRACT ITEM	CONTRACT AMOUNT	AMOUNT PAID TO DATE	AMOUNT DUE OR TO BECOME DUE

_____
CONTRACTOR

Subscribed and sworn to before me, a Notary Public, this _____day of _____; A.D. 20____.

_____
NOTARY PUBLIC

CONSENT OF SURETY COMPANY TO FINAL PAYMENT
(To be filed with final request for payment)

PROJECT: INTERIOR RENOVATIONS AND ASBESTOS ABATEMENT
SANDOVAL ELEMENTARY SCHOOL
SANDOVAL C.U.S.D. NO. 501
SANDOVAL, MARION COUNTY, ILLINOIS

TO (Owner): SANDOVAL C.U.S.D. NO. 501
859 WEST MISSOURI AVENUE
SANDOVAL, ILLINOIS 62882

CONTRACTOR:
(Name, address)

CONTRACT DATE: BOND NO.:

In accordance with the provisions between Owner and Contractor indicated above, _____
_____
_____ SURETY COMPANY, hereby approves of final payment to Contractor, and agrees that final payment to Contractor shall not relieve Surety Company of any of its obligations to Owner, as set forth in Surety Company's bond.

IN WITNESS WHEREOF, Surety Company has hereunto set its hand this _____ day of _____, 20____.

_____ _____
Attest: Surety Company

(Seal): _____
Signature of Authorized Representative

_____
Title

DOCUMENT 00 72 14

GENERAL CONDITIONS – AIA STIPULATED SUM

1.1 SUMMARY

A. Document Includes:
1. General Conditions.

B. Related Documents:
1. Document 00 52 14 – Agreement Form – AIA Stipulated Sum.
2. Document 00 73 13 – Supplementary Conditions - AIA.

1.2 GENERAL CONDITIONS

A. AIA Document A201-1997, General Conditions of the Contract for Construction, is the General Conditions of the Contract.

1.3 SUPPLEMENTARY CONDITIONS

A. Refer to Document 00 73 13 for modifications to General Conditions.

END OF DOCUMENT

DOCUMENT 00 73 13

SUPPLEMENTARY CONDITIONS - AIA

1.1 SUMMARY

A. Document Includes:
1. General Conditions.
2. Supplementary Conditions.

B. Related Documents:

1. Document 00 41 13 – Bid Form – Stipulated Sum
2. Document 00 52 14 – Agreement Form - AIA

1.2 GENERAL CONDITIONS

A. The General Conditions of the Contract for Construction, AIA Document A201, Fifteenth Edition, 1997, Articles 1 through 14, is a part of this Contract and is incorporated herein as fully as if here set forth. Copies of the General Conditions are on file and may be reviewed at the offices of the Architect, or may be obtained from the American Institute of Architects, St. Louis Chapter, 919 Olive Street, St. Louis, Missouri 63101.

1.3 SUPPLEMENTARY CONDITIONS

A. The following supplements modify, change, delete from or add to the "General Conditions of the Contract for Construction," AIA Document A201, Fifteenth Edition, 1997. Where any Article of the General Conditions is modified or changed or any Paragraph, Subparagraph or Clause thereof is modified, changed or deleted by these supplements, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect.

1.4 REFERENCE TO DIVISION 1

A. Where provisions of General Conditions relate to project administrative or work-related requirements of the Contract, those paragraphs are deleted from General Conditions, and are specified in Division 1, General Requirements of the Specifications. The deleted paragraphs are:

3.4	
3.6	3.12
3.7	3.13
3.8	3.14
3.10	3.15
3.11	9.2

1.5 ARTICLE 1: CONTRACT DOCUMENTS

A. DEFINITIONS: Replace 1.1.7 with new 1.1.7.

1.1.7 PROJECT MANUAL

The Project Manual is the collection of documents which includes the bidding requirements, sample forms and, certain Contract Documents such as the Conditions of the Contract and the Specifications.

B. CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS: Add new Clauses 1.2.2.1 and 1.2.2.2.

1.2.1.1 The Contractor further represents that he has carefully examined the Site of the Work at each location and that he has full knowledge of and fully understands the facilities, site conditions, difficulties and restrictions attending performance of the Work. Contractor further represents that he has taken all required measurements and carefully inspected existing constructions, irregularities and interferences which may affect the Work. No additional compensation will be allowed for conditions increasing Contractor's cost which were not known to or appreciated by him prior to executing the Contract if they could have been discovered by him following the foregoing procedures and thoroughly informing himself of all existing conditions affecting the Work.

1.2.1.2 Contractor will not, however, be required to excavate, penetrate or demolish any constructions or other work and conditions prior to executing the Contract in order to uncover and/or expose concealed conditions that affect the Work. If, during course of construction, Contractor uncovers conditions that affect the work that could not have been known and understood by the above described careful examination of conditions affecting the Work, he shall promptly notify the Architect, in writing, who will determine if claims for additional costs or extensions of time are justified. If such claims are found to be justified, Contract will be modified in accordance with Article 12 of the General Conditions.

1.6 ARTICLE 2: OWNER

A. 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER:

B. Delete Subparagraphs 2.2.3 and 2.2.5 in their entireties and substitute the following:

2.2.3 The Owner shall, at the request of the Contractor, furnish to Contractor any survey or other similar descriptive information of project site that Owner has in his possession. Upon demonstration of need by Contractor for specific additional survey information, Owner shall obtain and furnish such information to Contractor.

2.2.5 Contractor will be furnished, free of charge, 6 copies of Drawings and Project Manual as set forth in Division 1 of the Specifications. Additional copies will be furnished to Contractor at cost of reproduction, postage and handling.

1.7 ARTICLE 3: CONTRACTOR

A. 3.2. REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR: Add new Subparagraph 3.2.3.1:

3.2.3.1 Contractor shall satisfy himself as to the accuracy of all grades, elevations, dimensions and locations. Any errors due to Contractor's failure to so verify all such grades, elevations, dimensions and locations shall be promptly rectified by Contractor without additional cost to Owner.

B. 3.4. LABOR AND MATERIALS: Delete Paragraph 3.4. in its entirety. Refer to Specification Section 01 10 00, Summary, for provisions on this subject. References to Paragraph 3.4 elsewhere in the Contract Documents shall read as referring to Section 01 10 00 of the Specifications.

C. 3.6. TAXES: Delete Paragraph 3.6 in its entirety. Refer to Specification Section 01 10 00, Summary, for provisions on this subject. References to Paragraph 3.6 elsewhere in the Contract Documents shall read as referring to Section 01 10 00 of the Specifications.

D. 3.7 PERMITS, FEES AND NOTICES: Delete Paragraph 3.7 in its entirety. Refer to Specification Section 01 10 00, Summary, for provisions on this subject. References to Paragraph 3.7 elsewhere in the Contract Documents shall read as referring to Section 01 10 00 of the Specifications.

E. 3.8 ALLOWANCES: Delete Paragraph 3.8 in its entirety.

F. 3.11 DOCUMENTS AND SAMPLES AT THE SITE: Delete Paragraph 3.11 in its entirety.

G. 3.13 USE OF SITE: Delete Paragraph 3.13 in its entirety. Refer to Specification Section 01 10 00, Summary, for provisions on this subject. References to Paragraph 3.13 elsewhere in the Contract Documents shall read as referring to Section 01 10 00 of the Specifications.

H. 3.15 CLEANING UP: Delete Paragraph 3.15 in its entirety. Refer to Specification Section 01 70 00, Execution and Closeout Requirements, for provisions on this subject. References to Paragraph 3.15 elsewhere in the Contract Documents shall read as referring to Section 01 70 00 of the Specifications.

1.8 ARTICLE 5: SUBCONTRACTORS

A. 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK: Add new Clause 5.2.1.1.:

5.2.1.1. Within ten (10) days of notification of acceptance of his proposal, Contractor shall submit the names of those to whom he intends to award a

Subcontract.

1.9 ARTICLE 6: CONSTRUCTION WORK BY OWNER OR BY SEPARATE CONTRACTORS

A. 6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS: Delete Subparagraph 6.1.3 and its entirety and substitute the following:

6.1.3 General Contractor shall have responsibility of coordinating efforts of all contractors and to maintain overall direction of job progress. Each Contractor shall coordinate operational methods with other contractors and encourage communications among all trades. All Contractors shall make other contractors aware of any problems, delays in materials shipments or lack of work force, and assist other contractors in maintaining job momentum and direction of overall project.

1.10 ARTICLE 9: PAYMENTS AND COMPLETION

A. 9.2 SCHEDULE OF VALUES: Add new Paragraph 9.2:

9.2 SCHEDULE OF VALUES: Delete Paragraph 9.2 in its entirety. Refer to Specification Section 01 20 00, Price and Payment Procedures, for provisions on this subject. References to Paragraph 9.2 elsewhere in the Contract Documents shall read as referring to Section 01 20 00 of the Specifications.

B. APPLICATIONS FOR PAYMENT: Add the following Sub-Subparagraph

9.3.1.3.: Until Substantial Completion, the Owner will pay 90 percent of the amount due Contractor on account of approved progress payments.

1.11 ARTICLE 11: INSURANCE AND BONDS

A. 11.1.1 In the first line following the word "maintain," insert the words "in a company or companies licensed to do business in the state in which the project is located."

B. Add new Subparagraph 11.1.1.9:

1.1.1.9 General Liability Insurance shall be comprehensive, on occurrence form, and shall include:

1. Premises and Operations.
2. Independent Contractors.
3. Products and Completed Operations.
4. Broad Form Property Damage.
5. Personal Injury.
6. Explosion, Collapse and Underground damage where the hazard exists.
7. Contractual liability.

C. Add the following Sub-Subparagraphs to Subparagraph 11.1.2:

11.1.2.1 The insurance required by Subparagraph 11.1.1 shall be written for not less than the following, or greater if required by law:

1. Worker's Compensation:
   a. State: Statutory
   b. Applicable Federal: Statutory
   c. Employer's Liability: $500,000

2. Comprehensive General Liability:
   a. Bodily Injury:
      $ 500,000 Each Person
      $1,000,000 Aggregate
   b. Property Damage:
      $ 500,000 Each Occurrence
      $1,000,000 Aggregate
   c. $1,000,000 Combined Single

Limit Coverage for bodily injury and property damage per occurrence and in the same aggregate limit will be accepted in lieu of the separate limits specified above.

   d. Include liabilities arising from the Illinois Structural Work Law (Scaffolding Act).

3. Personal Injury:
   $ 1,000,000 Combined single limit including owned non-owned, and hired motor vehicle.

4. Comprehensive Automobile Liability:
   a. Bodily Injury:
      $1,000,000 Each Person
      $1,000,000 Each Occurrence
   b. Property Damage:
      $ 500,000 Each Occurrence
      $1,000,000 Aggregate
   c. $1,000,000 Combined Single
      Limit coverage for bodily injury and property damage peroccurrence and in the same aggregate limit will be accepted in lieu of the separate limits specified above.

11.1.2.2 Umbrella Form Liability Coverage:

An Umbrella Form Liability coverage to not less than $1,000,000 for any one occurrence and subject to the same aggregate over the Employer's Liability, Comprehensive General Liability, and Comprehensive Automobile Liability coverage is required.

D. Add the following Clause 11.1.3.1:

11.1.3.1 The Owner and Architect shall be named as additional insureds by endorsement for the purpose of coverage only with no liability for premium payments.

E. 11.1.3: Add new Subparagraph 11.1.3.2:

11.1.3.2 Contractor shall furnish one copy each of Certificates of Insurance herein required for each copy of the Agreement which shall specifically set forth evidence of all coverage required by Subparagraphs 11.1.1, 11.1.2 and 11.1.3. The form of the Certificate shall be AIA Document G705, Certificate of Insurance. Contractor shall furnish to the Owner copies of any endorsements that are subsequently issued amending coverage or limits. The Contractor shall submit copies of subcontractor's Certificates of Insurance prior to the beginning of work.

F. 11.4.1 PROPERTY INSURANCE: Delete this Paragraph. Add new paragraph 11.4.1 as follows:

11.4.1: The General Contractor shall be responsible to maintain property insurance upon the completed value of all work at the site under this contract to the full insurable value thereof. This insurance shall include the interests of the Owner, the General Contractor, Subcontractors, and Sub-subcontractors in the work and as their interests may appear in the work, and shall be an all-risk type policy, including theft, subject to the exclusions generally accepted in the insurance industry. This coverage is not intended to, and shall not, provide coverage for tools, equipment, scaffolding, forms, or other devices used by the Contractors or Subcontractors in performing work under this contract.

1.12 ARTICLE 13: MISCELLANEOUS PROVISIONS

A. Add new paragraph 13.8 as follows:

13.8 REFERENCED STANDARDS

13.8.1 No provision of any referenced standard specification, manual or code; whether or not specifically incorporated by reference in the Contract Documents; shall be effective to change the duties and responsibilities of Owner, Contractor or Architect, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to Architect, or any of Architect's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Articles 1 through 14.

END OF SECTION

ARTICLE 25: PREVAILING RATE OF WAGES

25.1 Pursuant to Illinois Compiled Statutes 820 ILCS 130/0.01 et seq., these specifications list on the following pages, the Illinois Department of Labor prevailing rate of wages for the county where the contract is being performed and for each craft or type of worker needed to execute the contract.

Marion County Prevailing Wage Rates posted on 12/1/2020

Trade Title	Rg	Type	C	Base	Foreman	M-F Overtime	H/W	Pension	Vac	Trng
ASBESTOS ABT-GEN	All	ALL		29.00	29.45	1.5	7.63	16.79	0.00	0.90
ASBESTOS ABT-MEC	All	BLD		32.00	33.00	1.5	9.00	6.25	0.00	0.50
BOILERMAKER	All	BLD		39.00	41.50	1.5	7.07	24.52	1.50	1.05
BRICK MASON	All	BLD		34.38	36.44	1.5	9.50	14.35	0.00	0.88
CARPENTER	All	BLD		37.63	39.13	1.5	7.72	10.05	0.00	0.65
CARPENTER	All	HWY		37.81	39.56	1.5	7.72	10.05	0.00	0.65
CEMENT MASON	All	BLD		30.83	32.33	1.5	9.85	9.16	0.00	0.50
CEMENT MASON	All	HWY		30.09	31.59	1.5	9.85	8.94	0.00	0.30
CERAMIC TILE FINISHER	All	BLD		26.99		1.5	8.00	6.98	0.00	0.81
ELECTRIC PWR EQMT OP	All	ALL	1	43.88		1.5	7.75	12.29	0.00	0.43
ELECTRIC PWR EQMT OP	All	ALL	2	39.13		1.5	7.75	10.95	0.00	0.39
ELECTRIC PWR GRNDMAN	All	ALL		32.13		1.5	7.75	8.99	0.00	0.32
ELECTRIC PWR LINEMAN	All	ALL		55.15	58.91	1.5	7.75	15.44	0.00	0.55
ELECTRICIAN	All	ALL		45.49	47.74	1.5	8.89	14.11	0.00	0.91
ELECTRONIC SYSTEM TECH	All	BLD		36.43	38.43	1.5	7.98	6.55	0.00	0.40
ELEVATOR CONSTRUCTOR	All	BLD		51.73	58.20	2.0	15.72	18.41	4.14	0.63
FLOOR LAYER	All	BLD		35.06	35.81	1.5	7.72	10.05	0.00	0.65
GLAZIER	All	BLD		29.13	30.38	1.5	6.57	9.00	0.00	0.50
HEAT/FROST INSULATOR	All	BLD		39.38	40.38	1.5	10.79	13.10	0.00	0.80
IRON WORKER	All	ALL		34.50	36.50	1.5	10.46	17.00	0.00	0.42
LABORER	All	BLD		28.00	28.45	1.5	7.63	16.79	0.00	0.80
LABORER	All	HWY		28.00	28.45	1.5	7.63	16.79	0.00	0.80
MACHINIST	All	BLD		49.68	52.18	1.5	7.93	8.95	1.85	1.47
MARBLE FINISHER	All	BLD		26.99		1.5	8.00	6.98	0.00	0.81
MARBLE MASON	All	BLD		32.47	33.97	1.5	8.00	8.00	0.00	0.90
MILLWRIGHT	All	BLD		37.63	39.13	1.5	7.72	10.05	0.00	0.65
MILLWRIGHT	All	HWY		37.81	39.56	1.5	7.72	10.05	0.00	0.65
OPERATING ENGINEER	All	BLD	1	39.85	42.85	1.5	13.55	18.65	0.00	1.25
OPERATING ENGINEER	All	BLD	2	38.72	42.85	1.5	13.55	18.65	0.00	1.25
OPERATING ENGINEER	All	BLD	3	34.24	42.85	1.5	13.55	18.65	0.00	1.25
OPERATING ENGINEER	All	BLD	4	34.30	42.85	1.5	13.55	18.65	0.00	1.25
OPERATING ENGINEER	All	BLD	5	33.97	42.85	1.5	13.55	18.65	0.00	1.25
OPERATING ENGINEER	All	BLD	6	42.40	42.85	1.5	13.55	18.65	0.00	1.25

OPERATING ENGINEER	All	BLD	7	42.70	42.85	1.5	13.55	18.65	0.00	1.25
OPERATING ENGINEER	All	BLD	8	42.98	42.85	1.5	13.55	18.65	0.00	1.25
OPERATING ENGINEER	All	BLD	9	40.85	42.85	1.5	13.55	18.65	0.00	1.25
OPERATING ENGINEER	All	HWY	1	38.35	41.35	1.5	13.55	18.65	0.00	1.25
OPERATING ENGINEER	All	HWY	2	37.22	41.35	1.5	13.55	18.65	0.00	1.25
OPERATING ENGINEER	All	HWY	3	32.74	41.35	1.5	13.55	18.65	0.00	1.25
OPERATING ENGINEER	All	HWY	4	32.80	41.35	1.5	13.55	18.65	0.00	1.25
OPERATING ENGINEER	All	HWY	5	32.47	41.35	1.5	13.55	18.65	0.00	1.25
OPERATING ENGINEER	All	HWY	6	40.90	41.35	1.5	13.55	18.65	0.00	1.25
OPERATING ENGINEER	All	HWY	7	41.20	41.35	1.5	13.55	18.65	0.00	1.25
OPERATING ENGINEER	All	HWY	8	41.48	41.35	1.5	13.55	18.65	0.00	1.25
OPERATING ENGINEER	All	HWY	9	39.35	41.35	1.5	13.55	18.65	0.00	1.25
PAINTER	All	ALL		26.00	26.50	1.5	6.45	11.01	0.00	0.70
PAINTER OVER 30 FT.	All	ALL		29.10	29.60	1.5	6.45	11.01	0.00	0.70
PAINTER PWR EQMT	All	ALL		29.10	29.60	1.5	6.45	11.01	0.00	0.70
PILEDRIVER	All	BLD		37.63	39.13	1.5	7.72	10.05	0.00	0.65
PILEDRIVER	All	HWY		37.81	39.56	1.5	7.72	10.05	0.00	0.65
PIPEFITTER	All	BLD		38.50	42.35	1.5	9.57	7.65	0.00	1.00
PLASTERER	All	BLD		30.83	32.33	1.5	9.85	9.16	0.00	0.50
PLUMBER	All	BLD		38.50	42.35	1.5	9.57	7.65	0.00	1.00
ROOFER	All	BLD		28.85	29.85	1.5	9.30	5.05	0.00	0.00
SHEETMETAL WORKER	All	ALL		36.57	38.07	1.5	10.65	9.29	2.19	0.71
SPRINKLER FITTER	All	BLD		41.97	44.72	1.5	10.23	14.02	0.00	0.52
TERRAZZO FINISHER	All	BLD		26.99		1.5	8.00	6.98	0.00	0.81
TERRAZZO MASON	All	BLD		32.47	33.97	1.5	8.00	8.00	0.00	0.90
TRUCK DRIVER	All	ALL	1	39.04	43.28	1.5	13.52	6.86	0.00	0.25
TRUCK DRIVER	All	ALL	2	39.60	43.28	1.5	13.52	6.86	0.00	0.25
TRUCK DRIVER	All	ALL	3	39.91	43.28	1.5	13.52	6.86	0.00	0.25
TRUCK DRIVER	All	ALL	4	40.25	43.28	1.5	13.52	6.86	0.00	0.25
TRUCK DRIVER	All	ALL	5	41.33	43.28	1.5	13.52	6.86	0.00	0.25
TRUCK DRIVER	All	O&C	1	31.23	34.62	1.5	13.52	6.86	0.00	0.25
TRUCK DRIVER	All	O&C	2	31.68	34.62	1.5	13.52	6.86	0.00	0.25
TRUCK DRIVER	All	O&C	3	31.93	34.62	1.5	13.52	6.86	0.00	0.25
TRUCK DRIVER	All	O&C	4	32.20	34.62	1.5	13.52	6.86	0.00	0.25
TRUCK DRIVER	All	O&C	5	33.06	34.62	1.5	13.52	6.86	0.00	0.25

END OF SECTION

DRAWING NO.	TITLE
G-101	COVER SHEET
G-102	ABBREVIATIONS, LEGEND, GENERAL NOTES, AND SHEET INDEX
ASB-1	ASBESTOS ABATEMENT FLOOR PLANS
ASB-2	ASBESTOS ABATEMENT FLOOR PLANS
A-101	DEMO AND PROPOSED FLOOR PLANS AND REFLECTED CEILING PLAN
A-102	DETAILS AND SCHEDULES
A-103	ALTERNATE BID #1 FLOOR PLAN AND DETAILS
ME-101	MECHANICAL AND ELECTRICAL PLANS
E-101	SPECIALTY SYSTEMS BY SECURITY ALARM CORPORATION

All drawings dated February 22, 2021

END 00 86 00.

SECTION 01 10 00

SUMMARY

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Contract description.

B. Work by Owner.

C. Contractor's use of site.

D. Owner occupancy.

E. Specification Conventions.

F. Contractor’s Duties

G. Contract Documents

1.2 CONTRACT DESCRIPTION

A. BASE BID consists of the abatement of approximately 1,850 square feet of carpet covered asbestos containing floor tile and mastic, including carpet and associated mastic under full containment methods, the abatement of 140 square feet of double layer asbestos containing floor tile and mastic under full containment methods and the abatement of approximately 2,770 square feet of single layer asbestos containing floor tile and mastic by infrared heat removal methods. Removal of all associated wall base material is commensurate with the work. The work also contains interior renovations necessary for the creation of new administrative offices within an existing classroom, including demolition, new metal stud and gypsum board partitions, new vinyl tile and carpet tile flooring and rubber base (to replace a portion of removed asbestos containing flooring materials – the balance of new flooring will be provided and installed by others under separate contract), new suspended acoustical panel ceilings, new paint and new casework. Mechanical and electrical work is commensurate with the renovation.

B. ALTERNATE BID #1 consists of the abatement of approximately 815 square feet of double layer asbestos containing floor tile and mastic under full containment methods. Removal of associated wall base material is commensurate with the work. The work also includes new vinyl tile flooring and rubber wall base materials (to replace a portion of the removed asbestos containing flooring materials - the balance of new flooring will be provided and installed by others under separate contract).

1.3 WORK BY OWNER

A. Items noted NIC (Not in Contract), will be furnished and installed by Owner.

1.4 CONTRACTOR'S USE OF SITE

A. Limit use of site to allow:
   1. Owner occupancy.
   2. Use of site by the public.

B. Construction Operations: Limited to areas noted on Drawings.

C. Allow for public use of all adjoining streets and sidewalks.

D. Light duty vehicle parking is permitted. All parking lots and sidewalks are to be restored to their original condition.

1.5 OWNER OCCUPANCY

A. The Owner will occupy the site during the entire period of construction.

B. Cooperate with Owner to minimize conflict, and to facilitate Owner's operations.

C. Schedule the Work to accommodate Owner occupancy.

1.6 SPECIFICATION CONVENTIONS

A. These specifications are written in imperative mood and streamlined form. This imperative language is directed to the Contractor, unless specifically noted otherwise. The words “shall be” are included by inference where a colon (:) is used within sentences or phrases.

1.7 CONTRACTOR’S DUTIES

A. Except as specifically noted, Contractor shall provide and pay for:
   1. All labor, materials, and equipment used for construction of and/or incorporated into the project.
   2. All tools, construction equipment and machinery.
   3. Required building permits, and all inspection fees by governmental authorities.
   4. Other facilities and services necessary for proper execution and complete of work.

B. Owner is exempt from sales tax on product permanently incorporated in work.
   1. Obtain sales tax exemption certificate number from Owner.
   2. Place exemption certificate number on invoices for materials incorporated in work.
   3. Upon completion of work, file with Owner a notarized statement that all purchases made under exemption certificate were entitled to be exempt and furnish copies of invoice to Owner.
   4. Pay legally assessed penalties for improper use of exemption certificate number.

C. Comply with codes, ordinances, rules, regulations, orders, and other legal requirements of public authorities which bear on performance of work.

D. Promptly submit written notice to Architect/Engineer of observed variance of contract documents from legal requirements.
   1. It is not the Contractor's responsibility to make certain that drawings and specifications comply with codes and regulations.
      a. Appropriate modifications to contract documents will account for/reflect necessary changes.
      b. Assume responsibility for work known to be contrary to such requirements if written notice is not provided by the Contractor to the Architect.

E. Enforce strict discipline and good order among employees.

F. Do not unreasonably encumber site with materials or equipment.

G. Do not load structure with weight that will endanger structure.

H. Assume full responsibility for protection and safe-keeping of products stored on premises.

I. Move any stored products which interfere with operations of Owner or other Contractors.

J. Obtain and pay for use of additional storage or work areas needed for operations.

K. The School Board shall prohibit the use of tobacco on school property when the property is being used for any school purposes. Tobacco shall mean cigarette, cigar, pipe or tobacco in any other form including smokeless tobacco which is any loose, cut, shredded, ground, powdered, compressed or leaf tobacco that is intended to be placed in the mouth without being smoked. All members of work crews must remain fully clothed and refrain from using obscene or profane language during these same time parameters. School purposes include, but are not limited to, all interscholastic or extracurricular athletic, academic, or other events sponsored by the School Board or in which students of the District participate.

L. Contractor shall maintain building free from entrance of water at all times during construction.

M. Contractor shall furnish, erect and maintain temporary ladders, ramps, or hoists as may be required for performance of his work.
   1. All such equipment shall be substantially designed, constructed, and maintained in accordance with applicable federal, state, and local laws, ordinances, and regulations, and shall be promptly removed when no longer needed.

N. Contractor shall design, furnish, erect, maintain, and move all ladders and scaffolding required for this work.
   1. All ladders and scaffolding shall be designed, constructed, and maintained in accordance with applicable federal, state, and local law, ordinances, and regulations, and shall be promptly removed when no longer needed.

1.8 CONTRACT DOCUMENTS

A. Contractor will be furnished free of charge four (4) copies of drawings and specifications.

B. On request, additional copies will be furnished to Contractor at cost of reproduction, postage and handling.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Schedule of values.

B. Applications for payment.

C. Change procedures.

D. Defect assessment.

E. Alternates.

1.2 SCHEDULE OF VALUES

A. Submit printed schedule on AIA Form G703 - Continuation Sheet for G702.

B. Submit Schedule of Values in duplicate within 10 days after date established in Notice to Proceed.

C. Format: Utilize Table of Contents of this Project Manual. Identify each line item with number and title of major specification Section. Identify site mobilization, bonds and insurance.

D. Include separately from each line item, direct proportional amount of Contractor's overhead and profit.

E. Revise schedule to list approved Change Orders, with each Application For Payment.

1.3 APPLICATIONS FOR PAYMENT

A. Submit four copies of each application on AIA Form G702-Application and Certificate for Payment.

B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.

C. Submit updated construction schedule with each Application for Payment.

D. Payment Period: Submit applications for payment to Architect/Engineer for processing no later than 10 days prior to date established for progress payment meeting.

E. Submit with transmittal letter as specified for Submittals in Section 01 33 00.

F. Application for Progress Payment No. 1 shall be accompanied by a notarized statement on Contractor's letterhead as follows:

1. I certify that the funds requested for the accompanying Pay Request No. 1 will be used to pay all just and lawful bills against the undersigned and his subcontractors for labor, material and equipment employed in the performance of the work. I further certify that such bills will be paid no later than ten (10) calendar days from date of receipt of the Owner's disbursement.
2. Execute statement with signature of a responsible officer of contracting firm.

G. Each subsequent application for progress payment shall be accompanied by the following supporting documents:

1. Partial or final waivers of lien in monetary amount from Contractor, each material supplier and/or subcontractor reflecting amounts incorporated into preceding request for progress payment.
2. A notarized Affidavit of Payment to Material Suppliers and Subcontractors.
   a. Affidavit shall be submitted in exact text as exhibit furnished by Architect/Engineers, signed by Contractor or Subcontractor.
   b. Include unit item, actual amount of contract without overhead or profit, amount paid to date, and amount to become due (balance of account).

H. Progress payments will be made for materials and equipment not incorporated in the work provided that:

1. Such materials and equipment have been delivered to and suitable stored at site or some other location approved in writing by Owner and Architect/Engineer. All such materials stored off-site shall be marked or tagged with identification of project to which they are assigned.
2. Contractor submits evidence of title to such materials and equipment.
3. Care and custody of such materials and equipment and all costs incurred for movement and storage shall be responsibility of Contractor.
4. Such materials and equipment are suitably insured by Contractor. Contractor shall submit a certificate of insurance showing the Owner as an additional insured and showing amount of insurance overage of suitable proof that material and equipment are stored in a bonded warehouse.

I. Refer to section 01 70 00 for submittal requirements for application for final payment and related closeout procedures.

1.4 CHANGE PROCEDURES

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

B. The Architect/Engineer will advise of minor changes in the Work not involving adjustment to Contract Sum/Price or Contract Time by issuing supplemental instructions in writing.

C. The Architect/Engineer may issue a Proposal Request including a detailed description of 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 will prepare and submit estimate within four days.

D. Contractor may propose changes by submitting a request for change to Architect/Engineer, describing proposed change and its full effect on the Work. Include a statement describing reason for the change, and effect on Contract Sum/Price and Contract Time with full documentation.

E. Stipulated Sum/Price Change Order: Based on Proposal Request and Contractor's fixed price quotation as approved by Architect/Engineer.

F. Architect/Engineer may issue directive, on Design Architects, Inc. Change Order form signed by Owner, instructing Contractor to proceed with change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work, and designate method of determining any change in Contract Sum/Price or Contract Time. Promptly execute change.

G. Maintain detailed records of work done on Time and Material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.

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

I. Execution of Change Orders: Architect/Engineer will issue Change Orders for signatures of parties as provided in Conditions of the Contract.

J. Correlation Of Contractor Submittals:
   1. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as separate line item and adjust Contract Sum/Price.
   2. Promptly revise progress schedules to reflect change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.
   3. Promptly enter changes in Project Record Documents.

1.5 DEFECT ASSESSMENT

A. Replace the Work, or portions of the Work, not conforming to specified requirements.

B. If, in the opinion of the Architect/Engineer, it is not practical to remove and replace the Work, the Architect/Engineer will direct appropriate remedy or adjust payment.

C. Authority of Architect/Engineer to assess defects and identify payment adjustments, is final.

D. Non-Payment For Rejected Products: Payment will not be made for rejected products for any of the following:
   1. Products wasted or disposed of in a manner that is not acceptable.
   2. Products determined as unacceptable before or after placement.
   3. Products not completely unloaded from transporting vehicle.
   4. Products placed beyond lines and levels of required Work.
   5. Products remaining on hand after completion of the Work.
   6. Loading, hauling, and disposing of rejected products.

1.6 ALTERNATES

A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in Owner-Contractor Agreement.

B. Coordinate related work and modify surrounding work.

C. Schedule of Alternates:
   1. Alternate No. 1 consists of the abatement of approximately 815 square feet of double layer asbestos containing floor tile and mastic under full containment methods. Removal of associated wall base material is commensurate with the work. The work also includes new vinyl tile flooring and rubber wall base materials (to replace a portion of the removed asbestos containing flooring materials - the balance of new flooring will be provided and installed by others under separate contract).

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Coordination and project conditions.

B. Preconstruction meeting.

C. Progress meetings.

D. Pre-installation meetings.

E. Cutting and patching.

F. Special procedures.

1.2 COORDINATION AND PROJECT CONDITIONS

A. Coordinate scheduling, submittals, and Work of various sections of Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, operating equipment.

C. Coordinate space requirements, supports, and installation of mechanical and electrical Work indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

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

E. Coordinate completion and clean-up of Work of separate sections in preparation for Substantial Completion.

F. Coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.3 PRECONSTRUCTION MEETING

A. Architect/Engineer will schedule meeting after Notice of Award.

B. Attendance Required: Owner, Architect/Engineer, and Contractor.

C. Agenda:
1. Designation of personnel representing parties in Contract, and Architect/Engineer.
2. Review of Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
3. Scheduling.

D. Architect/Engineer will record minutes and distribute copies with reasonable promptness after meeting to all in attendance and Owner.

1.4 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at maximum monthly intervals.

B. Architect/Engineer will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

C. Attendance Required: Job superintendent, major subcontractors and suppliers, Owner, Architect/Engineer, 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 impeding planned progress.
5. Review of submittals schedule and status of submittals.
6. Review of off-site fabrication and delivery schedules.
7. Maintenance of progress schedule.
8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding work period.
10. Coordination of projected progress.
11. Maintenance of quality and work standards.
12. Effect of proposed changes on progress schedule and coordination.
13. Other business relating to Work.

E. Architect/Engineer will record minutes and distribute copies with reasonable promptness after meeting to participants, with copies to Owner, and those affected by decisions made.

1.5 PRE-INSTALLATION MEETINGS

A. When required in individual specification sections, convene pre-installation meetings at Project site prior to commencing work of specific section.

B. Require attendance of parties directly affecting, or affected by, Work of specific section.

C. Notify Architect/Engineer four days in advance of meeting date.

D. Prepare agenda and preside at meeting:
   1. Review conditions of installation, preparation and installation procedures.
   2. Review coordination with related work.

E. Architect/Engineer will record minutes and distribute copies with reasonable promptness after meeting to participants, with copies to Owner.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 CUTTING AND PATCHING

A. Employ skilled and experienced installer to perform cutting and patching.

B. Submit written request in advance of cutting or altering elements affecting:
   1. Structural integrity of element.
   2. Integrity of weather-exposed or moisture-resistant elements.
   3. Efficiency, maintenance, or safety of element.
   4. Visual qualities of sight exposed elements.
   5. Work of Owner or separate contractor.

C. Execute cutting, fitting, and patching including excavation and fill, to complete Work, and to:
   1. Fit the several parts together, to integrate with other Work.
   2. Uncover Work to install or correct ill-timed Work.
   3. Remove and replace defective and non-conforming Work.
   4. Remove samples of installed Work for testing.
   5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.

D. Execute work by methods to avoid damage to other Work, and to provide proper surfaces to receive patching and finishing.

E. Cut masonry and concrete materials using masonry saw or core drill.

F. Restore Work with new products in accordance with requirements of Contract Documents.

G. Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

H. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.

I. Refinish or restore surfaces and finished to match existing finishes. For continuous surfaces, refinish to nearest intersection; for assembly, refinish entire unit.

J. Identify hazardous substances or conditions exposed during the Work to Architect/Engineer for decision or remedy.

3.2 SPECIAL PROCEDURES

A. Materials: As specified in product sections; match existing with new products and salvaged products for patching and extending work.

B. Employ skilled and experienced installer to perform alteration work.

C. Cut, move, or remove items as necessary for access to alterations and renovation Work. Replace and restore at completion.

D. Remove unsuitable material not marked for salvage, including rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.

E. Remove debris and abandoned items from area and from concealed spaces.

F. Prepare surface and remove surface finishes to permit installation of new work and finishes.

G. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.

H. Remove, cut, and patch Work in manner to minimize damage and to permit restoring products and finishes to original condition.

I. Refinish existing visible surfaces to remain in renovated rooms and spaces, to specified condition for each material, with neat transition to adjacent finishes.

J. Where new Work abuts or aligns with existing, provide smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.

K. When finished surfaces are cut so that smooth transition with new Work is not possible, terminate existing surface along straight line at natural line of division and submit recommendation to Architect/Engineer for review.

L. Where change of plane of 1/4 inch or more occurs, submit recommendation for providing smooth transition; to Architect/Engineer for review.

M. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.

N. Finish surfaces as specified in individual product sections.

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Submittal procedures.

B. Construction progress schedules.

C. Proposed products list.

D. Product data.

E. Shop drawings.

F. Samples.

G. Design data.

H. Test reports.

I. Certificates.

J. Manufacturer's instructions.

K. Manufacturer's field reports.

L. Erection drawings.

1.2 SUBMITTAL PROCEDURES

A. Transmit each submittal with shop drawing submittal form found at the end of this section.

B. Sequentially number transmittal forms. Mark revised submittals with original number and sequential alphabetic suffix.

C. Identify Project, Contractor, subcontractor and supplier; pertinent drawing and detail number, and specification section number, appropriate to submittal.

D. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.

E. Schedule submittals to expedite Project, and deliver to Architect/Engineer at 1400 E. Tremont St., Hillsboro, Illinois 62049. Coordinate submission of related items.

F. For each submittal for review, allow 15 days excluding delivery time to and from Contractor.

G. Identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of completed Work.

H. Allow space on submittals for Contractor and Architect/Engineer review stamps.

I. When revised for resubmission, identify changes made since previous submission.

J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.

K. Submittals not requested will not be recognized or processed.

1.3 CONSTRUCTION PROGRESS SCHEDULES

A. Submit initial schedules within 15 days after date established in Notice to Proceed. After review, resubmit required revised data within ten days.

B. Submit revised Progress Schedules with each Application for Payment.

C. Distribute copies of reviewed schedules to Project site file, subcontractors, suppliers, and other concerned parties.

D. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

E. Submit computer generated horizontal bar chart with separate line for each major portion of Work or operation, identifying first work day of each week.

F. Indicate estimated percentage of completion for each item of Work at each submission.

G. Submit separate schedule of submittal dates for shop drawings, product data, and samples, and dates reviewed submittals will be required from Architect/Engineer. Indicate decision dates for selection of finishes.

H. Revisions To Schedules:
   1. Indicate progress of each activity to date of submittal, and projected completion date of each activity.
   2. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.
   3. Prepare narrative report to define problem areas, anticipated delays, and impact on Schedule. Report corrective action taken, or proposed, and its effect including effect of changes on schedules of separate contractors.

1.4 PROPOSED PRODUCTS LIST

A. Within 15 days after date of Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.5 PRODUCT DATA

A. Product Data: Submit to Architect/Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.

B. Submit number of copies Contractor requires, plus 3 copies Architect/Engineer will retain.

C. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

D. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

E. After review, produce copies and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents described in Section 01 70 00.

1.6 SHOP DRAWINGS

A. Shop Drawings: Submit to Architect/Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.

B. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. When required by individual specification sections, provide shop drawings signed and sealed by professional engineer responsible for designing components shown on shop drawings.
   1. Include signed and sealed calculations to support design.
   2. Submit drawings and calculations in form suitable for submission to and approval by authorities having jurisdiction.
   3. Make revisions and provide additional information when required by authorities having jurisdiction.

D. Submit number of opaque reproductions Contractor requires, plus 3 copies Architect/Engineer will retain.

E. After review, produce copies and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents described in Section 01 70 00.

1.7 SAMPLES

A. Samples: Submit to Architect/Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.

B. Samples For Selection as Specified in Product Sections:
   1. Submit to Architect/Engineer for aesthetic, color, or finish selection.
   2. Submit samples of finishes from full range of manufacturers' standard colors, textures, and patterns for Architect/Engineer selection.

C. Submit samples to illustrate functional and aesthetic characteristics of Products, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

D. Include identification on each sample, with full Project information.

E. Submit number of samples specified in individual specification sections; Architect/Engineer will retain one sample.

F. Reviewed samples which may be used in the Work are indicated in individual specification sections.

G. Samples will not be used for testing purposes unless specifically stated in specification section.

H. After review, produce duplicates and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents purposes described in Section 01 70 00.

1.8 DESIGN DATA

A. Submit for Architect/Engineer's knowledge as contract administrator or for Owner.

B. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.9 TEST REPORTS

A. Submit for Architect/Engineer's knowledge as contract administrator or for Owner.

B. Submit test reports for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.10 CERTIFICATES

A. When specified in individual specification sections, submit certification by manufacturer, installation/application subcontractor, or Contractor to Architect/Engineer, in quantities specified for Product Data.

B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Architect/Engineer.

1.11 MANUFACTURER'S INSTRUCTIONS

A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, to Architect/Engineer for delivery to Owner in quantities specified for Product Data.

B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.12 MANUFACTURER'S FIELD REPORTS

A. Submit reports for Architect/Engineer's benefit as contract administrator or for Owner.

B. Submit report in duplicate within 30 days of observation to Architect/Engineer for information.

C. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.13 ERECTION DRAWINGS

A. Submit drawings for Architect/Engineer's benefit as contract administrator or for Owner.

B. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

C. Data indicating inappropriate or unacceptable Work may be subject to action by Architect/Engineer or Owner.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

HURST-ROSCHE, INC.

SHOP DRAWING SUBMITTAL

PROJECT: Interior Renovations and Asbestos Abatement
Sandoval Elementary School
Sandoval C.U.S.D. No. 501
Sandoval, Marion County, Illinois

DATE:_____

A/E PROJECT NO: 150-3600

CONTRACTOR: _____

PRESENTED BY:
(Subcontractor/Supplier)

_____
Company Name

_____
Address

_____
Phone/Fax

_____
Contact Person

ITEM: _____

SPEC SECTION: _____

_____

By approving and submitting these shop drawings, product data and samples, we represent that we have determined and verified all materials, field measurements and field construction criteria related thereto, or will do so, and that we have checked and coordinated information contained within submittal with requirements of the work and contract documents.

_____
Contractor's Signature

_____
Date

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Quality control and control of installation.

B. Tolerances

C. References.

D. Testing and inspection services.

E. Manufacturers' field services.

F. Examination.

G. Preparation.

1.2 QUALITY CONTROL AND CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. When manufacturers' instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform Work by persons qualified to produce required and specified quality.

F. Verify field measurements are as indicated on Shop Drawings or as instructed by manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.3 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. When manufacturers' tolerances conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

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

1.4 REFERENCES

A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current on date of Contract Documents, except where specific date is established by code.

C. Obtain copies of standards where required by product specification sections.

D. When specified reference standards conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

E. Neither contractual relationships, duties, nor responsibilities of parties in Contract nor those of Architect/Engineer shall be altered from Contract Documents by mention or inference otherwise in reference documents.

1.5 TESTING AND INSPECTION SERVICES

A. Architect/Engineer will employ and pay for specified services of a testing laboratory to perform testing and inspection.

B. The testing firm will perform tests, inspections, and other services specified in individual specification sections and as required by Architect/Engineer.

C. Reports will be submitted by independent firm to Architect/Engineer and Contractor, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.

D. Cooperate with testing firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
   1. Notify Architect/Engineer and independent firm 24 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.

E. Testing and employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

F. Re-testing or re-inspection required because of non-conformance to specified requirements shall be performed by same independent firm on instructions by Architect/Engineer. Payment for re-testing or re-inspection will be charged to Contractor by deducting testing charges from Contract Sum/Price.

G. Agency Responsibilities:
1. Test samples of mixes submitted by Contractor.
2. Provide qualified personnel at site. Cooperate with Architect/Engineer and Contractor in performance of services.
3. Perform specified sampling and testing of products in accordance with specified standards.
4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
5. Promptly notify Architect/Engineer and Contractor of observed irregularities or non-conformance of Work or products.
6. Perform additional tests required by Architect/Engineer.
7. Attend preconstruction meetings and progress meetings.

H. Agency Reports: After each test, promptly submit copies of report to Architect/Engineer and to Contractor. When requested by Architect/Engineer, provide interpretation of test results. Include the following:
1. Date issued.
2. Project title and number.
3. Name of inspector.
4. Date and time of sampling or inspection.
5. Identification of product and specifications section.
6. Location in Project.
7. Type of inspection or test.
8. Date of test.
9. Results of tests.
10. Conformance with Contract Documents.

I. Limits On Testing Authority:
1. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency or laboratory may not approve or accept any portion of the Work.
3. Agency or laboratory may not assume duties of Contractor.
4. Agency or laboratory has no authority to stop the Work.

1.6 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.

B. Submit qualifications of observer to Architect/Engineer 30 days in advance of required observations. Observer subject to approval of Architect/Engineer.

C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

D. Refer to Section 01 33 00 - SUBMITTAL PROCEDURES, MANUFACTURERS' FIELD REPORTS article.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 EXAMINATION

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

B. Verify existing substrate is capable of structural support or attachment of new Work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Verify utility services are available, of correct characteristics, and in correct locations.

3.2 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Temporary Utilities:
1. Temporary electricity.
2. Temporary water service.
3. Temporary sanitary facilities.

B. Construction Facilities:
1. Vehicular access.
2. Parking.
3. Progress cleaning and waste removal.

C. Temporary Controls:
1. Barriers.
2. Security.
3. Water control.
4. Dust control.
5. Erosion and sediment control.
6. Noise control.
7. Pollution control.

D. Removal of utilities, facilities, and controls.

1.2 TEMPORARY ELECTRICITY

A. Owner will pay cost of energy used. Exercise measures to conserve energy. Utilize Owner’s existing power service.

B. Complement existing power service capacity and characteristics as required for construction operations.

C. Permanent convenience receptacles may be utilized during construction.

1.3 TEMPORARY WATER SERVICE

A. Owner will pay cost of temporary water. Exercise measures to conserve energy. Utilize Owner's existing water system, extend and supplement with temporary devices as needed to maintain specified conditions for construction operations.

1.4 TEMPORARY SANITARY FACILITIES

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

1.5 VEHICULAR ACCESS

A. Provide and maintain access to fire hydrants and control valves free of obstructions.

B. Provide means of removing mud from vehicle wheels before entering streets.

C. Use existing on-site roads for construction traffic.

1.6 PARKING

A. Use of existing on-site streets and driveways used for construction traffic is permitted. Tracked vehicles not allowed on paved areas.

B. Use of designated areas of existing parking facilities used by construction personnel is permitted.

C. Do not allow heavy vehicles or construction equipment in parking areas.

D. Maintenance:
1. Maintain traffic and parking areas in sound condition free of excavated material, construction equipment, products, mud, snow, and ice.
2. Maintain existing and permanent paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original, or specified, condition.

E. Removal, Repair:
1. Remove temporary materials and construction before Substantial Completion.
2. Repair existing facilities damaged by use, to original condition before Substantial Completion.

F. Mud From Site Vehicles: Provide means of removing mud from vehicle wheels before entering streets.

1.7 PROGRESS CLEANING AND WASTE REMOVAL

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing spaces.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and rubbish from site periodically and dispose off-site.

E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.8 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas to allow for Owner's use of site, and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide protection for plants designated to remain. Replace damaged plants.

C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.9 SECURITY

A. Security Program:
1. Protect Work existing premises and Owner's operations from theft, vandalism, and unauthorized entry.
2. Initiate program in coordination with Owner's existing security system at project mobilization.
3. Maintain program throughout construction period until Owner acceptance precludes need for Contractor security.

B. Entry Control:
1. Restrict entrance of persons and vehicles into Project site.
2. Allow entrance only to authorized persons with proper identification.
3. Maintain log of workers and visitors, make available to Owner on request.
4. Coordinate access of Owner's personnel to site in coordination with Owner's security forces.

C. Restrictions:
1. Do not allow cameras on site or photographs taken except by written approval of Owner.

1.10 WATER CONTROL

A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

1.11 DUST CONTROL

A. Execute Work by methods to minimize raising dust from construction operations.

B. Provide positive means to prevent air-borne dust from dispersing into atmosphere.

1.12 EROSION AND SEDIMENT CONTROL

A. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.

B. Minimize surface area of bare soil exposed at one time.

C. Provide temporary measures including berms, dikes, and drains, and other devices to prevent water flow.

D. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.

E. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

1.13 NOISE CONTROL

A. Provide methods, means, and facilities to minimize noise produced by construction operations.

1.14 POLLUTION CONTROL

A. 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.

B. Comply with pollution and environmental control requirements of authorities having jurisdiction.

1.15 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Final Application for Payment inspection.

B. Clean and repair damage caused by installation or use of temporary work.

C. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Products.

B. Product delivery requirements.

C. Product storage and handling requirements.

D. Product options.

E. Product substitution procedures.

F. Equipment electrical characteristics and components.

1.2 PRODUCTS

A. Furnish products of qualified manufacturers suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise.

B. Do not use materials and equipment removed from existing premises, except as specifically permitted by Contract Documents.

C. Furnish interchangeable components from same manufacturer for components being replaced.

1.3 PRODUCT DELIVERY REQUIREMENTS

A. Transport and handle products in accordance with manufacturer's instructions.

B. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.

C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.4 PRODUCT STORAGE AND HANDLING REQUIREMENTS

A. Store and protect products in accordance with manufacturers' instructions.

B. Store with seals and labels intact and legible.

C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

D. For exterior storage of fabricated products, place on sloped supports above ground.

E. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.

F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

G. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.

H. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.5 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Products of one of manufacturers named and meeting specifications, no options or substitutions allowed.

1.6 PRODUCT SUBSTITUTION PROCEDURES

A. Instructions to Bidders specify time restrictions for submitting requests for Substitutions during bidding period to requirements specified in this section.

B. Substitutions may be considered when a product becomes unavailable through no fault of Contractor.

C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

D. A request constitutes a representation that Bidder:
   1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product.
   2. Will provide same warranty for Substitution as for specified product.
   3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
   4. Waives claims for additional costs or time extension which may subsequently become apparent.

E. Substitutions will not be considered when they are indicated or implied on Shop Drawing or Product Data submittals, without separate written request, or when acceptance will require revision to Contract Documents.

F. Substitution Submittal Procedure:
   1. Submit three copies of request for Substitution for consideration. Limit each request to one proposed Substitution.
   2. Submit Shop Drawings, Product Data, and certified test results attesting to proposed product equivalence. Burden of proof is on proposer.
   3. Architect/Engineer will notify Contractor in writing of decision to accept or reject request.

PART 2 PRODUCTS

2.1 EQUIPMENT ELECTRICAL CHARACTERISTICS AND COMPONENTS

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

B. Cord and Plug: Furnish minimum 6 foot cord and plug including grounding connector for connection to electric wiring system. Cord of longer length is specified in individual specification sections.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01 70 00

EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Closeout procedures.

B. Final cleaning.

C. Protecting installed construction.

D. Project record documents.

E. Manual for materials and finishes.

F. Spare parts and maintenance products.

G. Product warranties and product bonds.

1.2 CLOSEOUT PROCEDURES

A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Architect/Engineer's review.

B. Provide submittals to Architect/Engineer required by authorities having jurisdiction.

C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

D. Owner will occupy site as specified in Section 01 10 00.

1.3 FINAL CLEANING

A. Execute final cleaning prior to final project assessment.

B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

C. Clean equipment and fixtures to sanitary condition with cleaning materials appropriate to surface and material being cleaned.

D. Replace filters of operating equipment.

E. Clean debris from roofs, gutters, downspouts, and drainage systems.

F. Clean site; sweep paved areas, rake clean landscaped surfaces.

G. Remove waste and surplus materials, rubbish, and construction facilities from site.

1.4 PROTECTING INSTALLED CONSTRUCTION

A. Protect installed Work and provide special protection where specified in individual specification sections.

B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

E. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

F. Prohibit traffic from landscaped areas.

1.5 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed Shop Drawings, Product Data, and Samples.
   6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress, not less than weekly.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   2. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
   3. Field changes of dimension and detail.
   4. Details not on original Contract drawings.

G. Submit documents to Architect/Engineer with claim for final Application for Payment.

1.6 MANUAL FOR MATERIALS AND FINISHES

A. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect/Engineer will review draft and return one copy with comments.

B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.

C. Submit one copy of completed volumes 15 days prior to final inspection. Draft copy be reviewed and returned after final inspection, with Architect/Engineer comments. Revise content of document sets as required prior to final submission.

D. Submit two sets of revised final volumes in final form within 10 days after final inspection.

E. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations. Include information for re-ordering custom manufactured products.

F. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

G. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Include recommendations for inspections, maintenance, and repair.

H. Additional Requirements: As specified in individual product specification sections.

I. Include listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.7 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Furnish spare parts, maintenance, and extra products in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

1.8 PRODUCT WARRANTIES AND PRODUCT BONDS

A. Obtain warranties and bonds executed in duplicate by responsible subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.

B. Execute and assemble transferable warranty documents and bonds from subcontractors, suppliers, and manufacturers.

C. Verify documents are in proper form, contain full information, and are notarized.

D. Co-execute submittals when required.

E. Include Table of Contents and assemble in three D side ring binder with durable plastic cover.

F. Submit prior to final Application for Payment.

G. Time Of Submittals:
1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
2. Make other submittals within ten days after Date of Substantial Completion, prior to final Application for Payment.
3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing date of acceptance as beginning of warranty or bond period.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 02 08 20 - ASBESTOS ABATEMENT

PART 1 GENERAL

1.1 SUMMARY

A. Base Bid: Asbestos Abatement Contractor provide:
   1. Complete removal and legal disposal of all asbestos containing materials (ACM) shown on Drawings ASB-1 and ASB-2 and as follows:
      a. Vinyl floor tile and vinyl floor tile mastic. As shown on drawings, various areas of floor tile are covered with carpet, and a limited area consists of two layers of floor tile.
      b. Carpet and carpet mastic covering floor tile.
      c. Cove base and cove base mastic.

B. By Others:
   1. Architect/Engineer:
      a. Contract third party firm to complete duties of APM/ASP per IDPH Rules and Regulations as the building Owner's representative.
   2. By Owner:
      a. Remove all movable items and equipment from abatement areas prior to initiation of abatement activities.
      b. Return all furnishings to abated areas after final clearance.
      c. Perform its responsibilities in accord with referenced Parts of the Rules and Regulations.
      d. Sign Waste Shipment Record or designate representative to sign Waste Shipment Record.

1.2 DEFINITIONS

A. See Abatement Act 105ILCS105, Section 3, and Rules and Regulations, 855.20.

1.3 REGULATORY REQUIREMENTS

A. The Illinois Asbestos Abatement Act, (105 Illinois Compiled Statues 105).

B. Rules and Regulations for the Asbestos Abatement Act, as amended (77 Illinois Administrative Code, ch. I: Department of Public Health (IDPH) Subchapter p: Part 855, referred to here as Rules and Regulations).

C. The Commercial and Public Building Asbestos Abatement Act, as amended (225 Illinois Compiled Statues 207).

D. Federal Requirements:
   1. NESHAP – National Emissions Standards for Hazardous Air Pollutants.
   2. OSHA – Occupational Safety and Health Administration, 200 Constitution Avenue, Washington, DC 20210.
   3. AHERA – Asbestos Hazard Emergency Response Act.
   4. ASHARA – Asbestos School Hazard Abatement Reauthorization Act.

1.4 FIELD QUALITY CONTROL

A. Architect/Engineer
   1. Employ Asbestos Project Manager (APM) to perform the duties and responsibilities specified in the Rules and Regulations as Owner's representative.
   2. Employ the Air Sampling Professional (ASP) in accord with the Rules and Regulations. ASP shall meet or exceed requirements of 855.220.

B. Contractor
   1. Provide air monitoring of own personnel to comply with all regulations. Provide a copy of all results to the APM within 24 hours.
   2. Pay any additional costs which arise from failure of final air clearance testing which may include costs for services of APM, ASP, laboratory, and/or Architect/Engineer.

C. The APM may issue emergency stop work orders to the Contractor.

1.5 SUBMITTALS

A. Contractor to make all submittals in accord with Rules and Regulations, Part 855.350.
   1. Submit to the Asbestos Project Manager:
      a. Documented evidence that each person, including Contractor's supervisor, performing asbestos work holds a valid IDPH License and accreditation certificate in accord with Rules and Regulations, Parts 855.20, 855.100, 855.110, 855.120.
      b. Documented evidence of current medical surveillance records of Contractor's employees.
      c. Documented evidence of respirator training and most recent fit testing of Contractor's employees.
   2. Contractor shall complete required sections of Notification of Demolition and Renovation Form and submit to Illinois Department of Public Health (IDPH) and Illinois Environmental Protection Agency (IEPA) as stipulated within Rules and Regulations, Part 855.220, and NESHAP regulations. Ensure notification is postmarked or hand delivered to IDPH and IEPA at least ten working days prior to the start of any abatement project.
      a. IDPH – Illinois Department of Public Health
         525 West Jefferson Street
         Springfield, Illinois
         217/782-3517
      b. IEPA – Illinois Environmental Protection Agency
         Asbestos Unit, MC 41
         1021 North Grand Avenue East
         P. O. Box 19276
         Springfield, Illinois 62794-9276
         217/782-3397
   3. Contractor shall obtain written permission from Owner authorizing initiation of abatement and submit at least 10 working days prior to start of any abatement project to IDPH.
   4. Forward a copy of each submittal to the Asbestos Project Manager.

1.6 PROTECTION. Provide protection for personnel and building in accord with Rules and Regulations.

1.7 PROJECT/SITE CONDITIONS

A. This project involves the removal of asbestos containing material used as floor coverings and cove base and associated mastics as indicated on the project plan sheets.

B. Contractor is allowed to use electrical supply located onsite. Coordinate use with Owner.

C. Contractor is allowed to use water supply located onsite. Coordinate use with Owner.

1.8 SEQUENCING/SCHEDULING

A. Abatement Contractor shall coordinate sequence of work and schedule of operations with Owner's occupancy/schedule.

B. Abatement Contractor shall coordinate sequence of work with other Contractors as directed by General Contractor.

PART 2 PRODUCTS/EQUIPMENT

2.1 ASBESTOS ABATEMENT EQUIPMENT. Use only materials and equipment complying with the Rules and Regulations, Part 855.390.

2.2 ACCEPTABLE MANUFACTURERS/PRODUCTS

A. Wetting Agent:

1.	Better Working Environments	Super Wet
2.	Certified Technologies	Certane 2075
3.	Eppert Oil Co.	Speed-Wet
4.	Foster Products Corp.	32-90
5.	Equivalent product to listed products.	

B. Combination Wetting Agent – Encapsulant:

1.	Better Working Environments	5000
2.	Certified Technologies	Certane 707
3.	Eppert Oil Co.	Fiber-Seal
4.	Foster Products Corp.	32-60
5.	Equivalent product to listed products.	

C. Lockdown Encapsulant:

1.	Better Working Environments	3000
2.	Certified Technologies	Certane 1050
3.	Eppert Oil Co.	Fiber-Seal
4.	Foster Products Corp.	32-60
5.	Equivalent product to listed products.	

PART 3 EXECUTION

3.1 PREPARATION

A. Abatement Contractor
   1. Perform all preparation work in accord with the Rules and Regulations.
   2. Procure, complete, and submit any required municipal, county, and/or state permits. Abatement Contractor shall be responsible for any fees associated with required permit.

B. Owner
   1. Shut down of utilities (i.e., electricity) leading to abatement areas.

3.2 PERFORMANCE

A. Perform all asbestos work in accord with all Rules and Regulations including:
   1. Commencement of Work: 855.450.
   2. Removal Procedures: 855.220.
   3. Encapsulation Procedures: 855.220 and 855.500.
   4. Cleanup Procedures: 855.230 and 855.465.

B. Variances/Alternatives: Contractor may request variances or alternative abatement methods or procedures in accord with the Rules and Regulations, Part 855.25. Submit variance requests to Architect/Engineer. An RFPCO shall be issued for all variances issued after bidding to adjust the price of the project to reflect any cost savings. A copy of the approved variance is to be provided to the APM by the Contractor. The variance shall be signed by the Contractor and APM and included with the project notification form and in the APM project report within 10 days after completion of project.

C. Disposal
   1. Label all bags or containers containing asbestos debris as follows:
      a. Sandoval CUSD No. 501
         300 Perry Avenue
         Sandoval, Illinois 62882
   2. Whenever trucks or dumpsters are being loaded or unloaded with asbestos waste, post signs in accord with the 1990 NESHAP STANDARD – DANGER, ASBESTOS DUST HAZARD, CANCER AND LUNG DISEASE HAZARD, AUTHORIZED PERSONNEL ONLY.
   3. Transport all waste to an IEPA approved landfill. Complete a waste shipment record for each load of waste in accord with the 1990 NESHAP STANDARD. Return the record, signed by waste disposal site owner/operator to APM.

3.3 CLEANUP

A. Perform all cleanup operations in accord with the Rules and Regulations, not limited to:
   1. Cleanup Procedures: 855.465.
   2. Clearance Air Monitoring and Analysis: 855.220.

3.4 RE-ESTABLISHMENT OF WORK AREA AND HVAC SYSTEMS

A. Perform the work in accord with Rules and Regulations, Part 855.240.

B. Reference plan sheets for reinstallation of replacement flooring by other trades within this contract and also by others under a separate contract.

3.5 ATTACHMENTS

A. State of Illinois Asbestos Abatement Project Notification Form.

END OF SECTION

SECTION 02 41 19 - SELECTIVE STRUCTURE DEMOLITION

PART 1 GENERAL

1.1 SUMMARY

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

1.2 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Demolition Schedule: Indicate overall schedule and interruptions required for utility and building services.

C. Shop Drawings:
1. Indicate demolition and removal sequence.
2. Indicate location of items designated for reuse and Owner's retention.
3. Indicate location and construction of temporary work.

1.3 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Accurately record actual locations of capped utilities, concealed utilities discovered during demolition, and subsurface obstructions.

C. Operation and Maintenance Data: Submit description of system, inspection data, and parts lists.

1.4 QUALITY ASSURANCE

A. Conform to applicable code for demolition work, dust control, and products requiring electrical disconnection and re-connection.

B. Conform to applicable code for procedures when hazardous or contaminated materials are discovered.

C. Obtain required permits from authorities having jurisdiction.

1.5 SEQUENCING

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

B. Owner will conduct salvage operations before demolition begins to remove materials Owner chooses to retain.

1.6 SCHEDULING

A. Section 01 30 00 - Administrative Requirements: Requirements for scheduling.

B. Schedule Work to coordinate with Phasing related to new construction as indicated on Drawings.

C. Cooperate with Owner in scheduling noisy operations and waste removal that may impact Owners operation in adjoining spaces.

D. Coordinate utility and building service interruptions with Owner.
   1. Do not disable or disrupt building fire or life safety systems without three days prior written notice to Owner.
   2. Schedule tie-ins to existing systems to minimize disruption.
   3. Coordinate Work to ensure fire alarms, smoke detectors, emergency lighting, exit signs and other life safety systems remain in full operation in occupied areas.

1.7 PROJECT CONDITIONS

A. Conduct demolition to minimize interference with adjacent and occupied building areas.

B. Cease operations immediately if structure appears to be in danger and notify Architect/Engineer. Do not resume operations until directed.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 PREPARATION

A. Notify affected utility companies before starting work and comply with their requirements.

B. Mark location and termination of utilities.

C. Erect, and maintain temporary barriers and security devices, including warning signs and lights, and similar measures, for protection of the public, Owner, and existing improvements indicated to remain.

D. Erect and maintain weatherproof closures for exterior openings.

E. Erect and maintain temporary partitions to prevent spread of dust, odors, and noise to permit continued Owner occupancy.

F. Prevent movement of structure; provide temporary bracing and shoring required to ensure safety of existing structure.

G. Provide appropriate temporary signage including signage for exit or building egress.

H. Do not close or obstruct building egress path.

I. Do not disable or disrupt building fire or life safety systems without 3 days prior written notice to Owner.

3.2 SALVAGE REQUIREMENTS

A. Coordinate with Owner to identify building components and equipment required to be removed and delivered to Owner.

B. Tag components and equipment Owner designates for salvage.

C. Protect designated salvage items from demolition operations until items can be removed.

D. Carefully remove building components and equipment indicated to be salvaged.

E. Disassemble as required to permit removal from building.

F. Package small and loose parts to avoid loss.

G. Mark equipment and packaged parts to permit identification and consolidation of components of each salvaged item.

H. Prepare assembly instructions consistent with disassembled parts. Package assembly instructions in protective envelope and securely attach to each disassembled salvaged item.

I. Deliver salvaged items to Owner. Obtain signed receipt from Owner.

3.3 DEMOLITION

A. Conduct demolition to minimize interference with adjacent and occupied building areas.

B. Maintain protected egress from and access to adjacent existing buildings at all times.

C. Do not close or obstruct roadways or sidewalks without permits.

D. Cease operations immediately when structure appears to be in danger and notify Architect/Engineer.

E. Disconnect and remove designated utilities within demolition areas.

F. Cap and identify abandoned utilities at termination points when utility is not completely removed. Annotate Record Drawings indicating location and type of service for capped utilities remaining after demolition.

G. Demolish in orderly and careful manner. Protect existing improvements, and supporting structural members.

H. Carefully remove building components indicated to be reused.
   1. Disassemble components as required to permit removal.
   2. Package small and loose parts to avoid loss.
   3. Mark components and packaged parts to permit reinstallation.
   4. Store components, protected from construction operations, until reinstalled.

I. Remove demolished materials from site except where specifically noted otherwise. Do not burn or bury materials on site.

J. Remove materials as Work progresses. Upon completion of Work, leave areas in clean condition.

K. Remove temporary Work.

L. Schedule phasing of Stage 1 and Stage 2 demolition with Construction Manager. See Drawings for more information.

END OF SECTION

SECTION 06 10 53 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 GENERAL

1.1 SUMMARY

A. Section includes concealed wood blocking for support of casework; and preservative treatment of wood.

B. Related Sections:
1. Division 8 - Openings: Window and door openings to receive wood blocking.

1.2 REFERENCES

A. American National Standards Institute:
1. ANSI A208.1 - Mat-Formed Wood Particleboard.

B. American Wood-Preservers' Association:
1. AWPA C1 - All Timber Products - Preservative Treatment by Pressure Process.
2. AWPA C20 - Structural Lumber - Fire-Retardant Treatment by Pressure Processes.

C. ASTM International:
1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

D. National Fire Protection Association:
1. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.

E. The Redwood Inspection Service:
1. RIS - Standard Specifications for Grades of California Redwood Lumber.

F. Southern Pine Inspection Bureau:
1. SPIB - Standard Grading Rules for Southern Pine Lumber.

G. Underwriters Laboratories Inc.:
1. UL 723 - Tests for Surface Burning Characteristics of Building Materials.

H. U. S Department of Commerce National Institute of Standards and Technology:
1. DOC PS 1 - Construction and Industrial Plywood.
2. DOC PS 2 - Performance Standard for Wood-Based Structural-Use Panels.
3. DOC PS 20 - American Softwood Lumber Standard.

I. West Coast Lumber Inspection Bureau:
1. WCLIB - Standard Grading Rules for West Coast Lumber.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit technical data on wood preservative and fire retardant treatment materials and application instructions.

1.4 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Requirements for coordination.

B. Coordinate Work of this Section with installation of prefabricated wood trusses.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with the following:
   1. Lumber Grading Agency: Certified by DOC PS 20.
   2. Wood Structural Panel Grading Agency: Certified by EWA - The Engineered Wood Association.
   3. Lumber: DOC PS 20.
   4. Wood Structural Panels: DOC PS 1 or DOC PS 2.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

C. Store materials according to manufacturer instructions.

PART 2 PRODUCTS

2.1 MATERIALS

A. Lumber Grading Rules: AP&PA, SPIB and WCLIB.

B. Miscellaneous Framing: Stress Group D, S/P/F, species, grade 19 percent maximum moisture content after treatment, pressure preservative treat.

C. Plywood: APA/EWA Rated Sheathing Structural I, Grade C-D; Exposure Durability 2; un-sanded. See Drawings for locations requiring fire retardant treated plywood.

2.2 ACCESSORIES

A. Fasteners and Anchors:
   1. Fasteners: Hot dipped galvanized steel for high humidity and treated wood locations, unfinished steel elsewhere.
   2. Nails and Staples: ASTM F1667.
   3. Anchors: Toggle bolt type for anchorage to hollow masonry. Expansion shield and lag bolt type for anchorage to solid masonry or concrete. Bolt or ballistic fastener for anchorages to steel.

2.3 FACTORY WOOD TREATMENT

A. Wood Preservative (Pressure Treatment): AWPA C1 using water borne preservative with 0.25 percent retainage.

B. Moisture Content After Treatment:
   1. Lumber: Maximum 19 percent.
   2. Structural Panels: Maximum 15 percent.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify substrate conditions are ready to receive blocking, curbing and framing.

3.2 INSTALLATION

A. Set members level and plumb, in correct position.

B. Place horizontal members, crown side up.

C. Construct curb members of solid wood sections.

3.3 SITE APPLIED WOOD TREATMENT

A. Apply preservative treatment.

B. Brush apply two coats of preservative treatment on wood in contact with cementitious materials, roofing and related metal flashings and treat site-sawn cuts.

C. Allow preservative to dry prior to erecting members.

END OF SECTION

SECTION 07 21 16 - BLANKET INSULATION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes acoustic sound batt insulation in interior wall construction.

B. Related Sections:
   1. Section 09 21 16 - Gypsum Board Assemblies

1.2 REFERENCES

A. ASTM International:
   1. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
   2. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

B. National Fire Protection Association:
   1. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.

C. Underwriters Laboratories Inc.:
   1. UL 723 - Tests for Surface Burning Characteristics of Building Materials.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit data on product characteristics, performance criteria, and limitations.

1.4 QUALITY ASSURANCE

A. Insulation Installed in Concealed Locations Surface Burning Characteristics:
   1. Batt Insulation: Maximum 10/10 flame spread/smoke developed index when tested in accordance with ASTM E84, NFPA 255, and UL 723.

1.5 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

PART 2 PRODUCTS

2.1 BATT INSULATION

A. Manufacturers:
   1. CertainTeed Insulation.
   2. Johns Manville.
   3. Owens Corning.
   4. Substitutions: Section 01 60 00 – Product Requirements.

2.2 COMPONENTS

A. Sound Attenuation Batt Insulation: ASTM C665, Type I; preformed glass fiber batts; friction fit, conforming to the following:
   1. Thermal Resistance: R19 for 5 ½ inch thickness.
   2. Facing: Unfaced.
   3. Thickness: 5 1/2 inch minimum at 6 inch metal studs.

B. Tape: Polyethylene or Polyester self-adhering type, mesh reinforced, 2 inches wide.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify substrate, adjacent materials, and insulation are dry and ready to receive insulation.

3.2 INSTALLATION

A. Install in interior walls without gaps or voids. Do not compress insulation. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids. Provide supplemental support for heights over 8 feet.

B. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within plane of insulation.

C. Tape seal butt ends and lapped flanges.

END OF SECTION

SECTION 07 84 00 - FIRESTOPPING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes firestopping and through-penetration protection system materials and accessories; firestopping tops of fire rated walls.

B. Related Sections:
1. Section 09 21 16 - Gypsum Board Assemblies: Gypsum board fireproofing.
2. Division 22: Plumbing work requiring firestopping.
3. Division 23: HVAC work requiring firestopping.
4. Division 26: Electrical work requiring firestopping.

1.2 REFERENCES

A. ASTM International:
1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
2. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
3. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
4. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems.

B. Intertek Testing Services (Warnock Hersey Listed):
1. WH - Certification Listings.

C. National Fire Protection Association:
1. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.

D. Underwriters Laboratories Inc.:
1. UL 263 - Fire Tests of Building Construction and Materials.
2. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
3. UL 1479 - Fire Tests of Through-Penetration Firestops.
4. UL 2079 - Tests for Fire Resistance of Building Joint Systems.
5. UL - Fire Resistance Directory.

1.3 DEFINITIONS

A. Firestopping (Through-Penetration Protection System): Sealing or stuffing material or assembly placed in spaces between and penetrations through building materials to arrest movement of fire, smoke, heat, and hot gases through fire rated construction.

1.4 SYSTEM DESCRIPTION

A. Firestopping Materials: ASTM E814 to achieve fire ratings as noted on Drawings for adjacent construction, but not less than 1-hour fire rating.

B. Firestopping Materials: UL 263, UL 1479, to achieve fire ratings of adjacent construction in accordance with UL Design Numbers noted in Schedule at end of this section.

C. Surface Burning: ASTM E84 with maximum flame spread / smoke developed rating of 25/450.

D. Firestop interruptions to fire rated assemblies, materials, and components.

1.5 PERFORMANCE REQUIREMENTS

A. Conform to applicable code for fire resistance ratings and surface burning characteristics.

B. Provide certificate of compliance from authority having jurisdiction indicating approval of materials used.

1.6 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit data on product characteristics, performance and limitation criteria.

C. Schedule: Submit schedule of opening locations and sizes, penetrating items, and required listed design numbers to seal openings to maintain fire resistance rating of adjacent assembly.

D. Manufacturer's Installation Instructions: Submit preparation and installation instructions.

E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

F. Engineering Judgements: For conditions not covered by UL or WH listed designs, submit judgements by licensed professional engineer suitable for presentation to authority having jurisdiction for acceptance as meeting code fire protection requirements.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

B. Applicator: Company specializing in performing Work of this section with minimum three years experience, and approved by manufacturer.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements.

B. Do not apply materials when temperature of substrate material and ambient air is below 60 degrees F.

C. Maintain this minimum temperature before, during, and for minimum 3 days after installation of materials.

D. Provide ventilation in areas to receive solvent cured materials.

PART 2 PRODUCTS

2.1 FIRESTOPPING

A. Manufacturers:
1. Dow Corning Corp.
2. Hilti Corp.
3. 3M fire Protection Products.
4. United States Gypsum Co.
5. Substitutions: Section 01 60 00 - Product Requirements.

B. Product Description: Different types of products by multiple manufacturers are acceptable as required to meet specified system description and performance requirements; provide only one type for each similar application.
1. Silicone Firestopping Elastomeric Firestopping: Single or Multiple component silicone elastomeric compound and compatible silicone sealant.
2. Foam Firestopping Compounds: Multiple component foam compound.
3. Formulated Firestopping Compound of Incombustible Fibers: Formulated compound mixed with incombustible non-asbestos fibers.
4. Fiber Stuffing and Sealant Firestopping: Composite of mineral or ceramic fiber stuffing insulation with silicone elastomer for smoke stopping.
5. Mechanical Firestopping Device with Fillers: Mechanical device with incombustible fillers and silicone elastomer, covered with sheet stainless steel jacket, joined with collars, penetration sealed with flanged stops.
6. Intumescent Firestopping: Intumescent putty compound which expands on exposure to surface heat gain.
7. Firestop Pillows: Formed mineral fiber pillows.

C. Color: Red or yellow.

2.2 ACCESSORIES

A. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces and suitable for required fire ratings.

B. Dam Material: Permanent:
   1. Mineral fiberboard.
   2. Mineral fiber matting.
   3. Sheet metal.

C. Installation Accessories: Provide clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify openings are ready to receive firestopping.

3.2 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter affecting bond of firestopping material.

B. Remove incompatible materials affecting bond.

C. Install backing and damming materials to arrest liquid material leakage.

3.3 APPLICATION

A. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping, ductwork, conduit and other items, requiring firestopping.

B. Apply primer where recommended by manufacturer for type of firestopping material and substrate involved, and as required for compliance with required fire ratings.

C. Apply firestopping material in sufficient thickness to achieve required fire and smoke rating, to uniform density and texture.

D. Compress fibered material to maximum 40 percent of its uncompressed size.

E. See Section 07 90 00 for joint protection at non-fire rated construction perimeters and openings containing penetrating sleeves, piping, ductwork, conduit and other items.

3.4 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements and 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Inspect installed firestopping for compliance with specifications and submitted schedule.

3.5 CLEANING

A. Section 01 70 00 - Execution and Closeout Requirements: Final cleaning.

B. Clean adjacent surfaces of firestopping materials.

3.6 PROTECTION OF INSTALLED CONSTRUCTION

A. Section 01 70 00 - Execution and Closeout Requirements: Protecting installed construction.

B. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 07 90 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Preparing sealant substrate surfaces.
   2. Sealant and backing.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. ASTM C717 - Standard Terminology of Building Seals and Sealants.
   2. ASTM C834 - Specification for Latex Sealants.
   3. ASTM C920 - Specification for Elastomeric Joint Sealants.
   4. ASTM D1056 - Flexible Cellular Material- Sponge or Expanded Rubber.

B. Federal Specifications (FS):
   1. FS SS-S-200 - Sealing Compounds, Two Component, Elastomeric, Polymer Type, Jet-Fuel Resistant, Cold Applied.
   2. FS TT-S-1657 - Sealing Compound, Single Component Butyl Rubber Based Solvent Release Type (for Buildings and other Types of Construction).
   3. COORDINATION

1.3 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Requirements for coordination.

B. Coordinate Work of this Section with Sections referencing this Section.

1.4 SUBMITTALS

A. Section 01 33 00 – Submittal Procedures: Procedures for submittals.
   1. Product Data: Product chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing Work of this Section with minimum 5 years documented experience.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01 60 00 - Product Requirements: Transport, handle, store, and protect products.

B. Deliver Products in manufacturer's original unopened containers or packages with labels intact, identifying product and manufacturer, date of manufacture, lot number, shelf life, curing time, and mixing instructions, where applicable.

C. Store and handle materials to prevent deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

D. Protection:
   1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
   2. Provide additional protection according to manufacturer instructions.

1.7 PROJECT CONDITIONS OR SITE CONDITIONS

A. Environmental Requirements: Install sealant during manufacturer's recommended temperature ranges and weather conditions for application and cure. Consult manufacturer when sealant cannot be applied during recommended conditions.

1.8 WARRANTY

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for warranties.

B. Warranty:
   1. Submit written warranty signed by sealant manufacturer agreeing to replace sealants and accessories which fail because of loss of cohesion or adhesion or which do not cure.
   2. Warranty Period: 5 years or longer per the manufacturers' standard warranties.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with project requirements, manufacturers offering specified items which may be incorporated into the work include the following:
   1. Bostik, Inc, Huntingdon Valley, PA, (800) 523-2678, (125) 674-5600.
   2. Dow Corning, Midland, MI (517) 496-4000.
   3. GE Silicones, Waterford, NY (518) 233-3330.
   4. Mameco International, Cleveland, OH, (800) 321-6412, (216) 752-4400.
   5. W.R. Meadows, Inc, Elgin, IL (800) 342-5976, (847) 683-4500.
   6. Nomaco, Inc., Zebulon, NC, (919) 269-6500.
   7. Pecora Corporation, Harleysville, PA, (800) 523-6688, (215) 723-6051.

8. Sika Corporation, Lyndhurst, NJ, (800) 933-7452, (201) 933-8800.
9. Sonneborn Building Products Div. ChemRex, Inc., Shakopee, MN (800) 243-6739, (612) 496-6000.
10. Tremco, Beachwood, OH, (800) 852-3821, (216) 292-5000.
11. USG Corp., Chicago, IL (800) 874-4968, (312) 606-4000.

2.2 BUILDING SEALANTS (See Sealant Schedule at the end of this Section for specific use of sealants.)

A. Urethanes:
1. Type 1: Two-Part Urethane: Self-Leveling, ASTM C920, Type M, Grade P, Class 25.
   a. Chem-Calk CC-550, by Bostik.
   b. Vulkem 245, by Mameco.
   c. Vulkem 255, Wide-Joint, by Mameco.
   d. NR-200 Urexpan, by Pecora Corporation.
2. Type 2: Two-Part Urethane: Non-Sag, ASTM C920, Type M, Grade NS, Class 25.
   a. Chem-Calk 500, by Bostik.
   b. Vulkem 227, by Mameco.
   c. Sonolastic NP 2, by Sonneborn Building Products, ChemRex Inc.
3. Type 3: One-Part Urethane: Self-Leveling, ASTM C920, Type S, Grade P, Class 25.
   a. Vulkem 45, by Mameco.
   b. Urexpan NR-201, by Pecora Corporation.
   c. Sonolastic SL1, by Sonneborn Building Products, ChemRex Inc.
   d. Sikaflex 1C-SL by Sika.
4. Type 4: One-Part Urethane: Non-Sag, ASTM C920, Type S, Grade NS, Class 25.
   a. Chem-Calk 900, by Bostik.
   b. Vulkem 116, by Mameco.
   c. Sonolastic NP I, by Sonneborn Building Products, ChemRex Inc.

B. Silicones:
1. Type 1: One-Part Silicones: ASTM C920, Type S, Grade NS, Class 50.
   a. 795 Silicone Building Sealant, by Dow Corning.
   b. 864 Architectural Silicone Sealant, by Pecora Corporation.
2. Type 2: One-Part Silicones: ASTM C920, Type S, Grade NS, Class 25.
   a. 999-A Silicone Building & Glazing Sealant, Dow Corning.
   b. Construction 1200 Sealant, General Electric Company.
3. Type 3: One-Part Silicones: ASTM C920, Type S, Grade NS, Class 25. Vertical Surfaces Only.
   a. Construction 1200 Sealant, General Electric Company.
   b. 999-A, Dow Corning.
   c. 860 Glaziers and Contractors Silicone Sealant, by Pecora Corporation. (colors only)
4. Type 4: One-Part Silicones: ASTM C920, Type S, Grade NS, Class 25 or 50.
   a. 786 Mildew Resistant Silicone Sealant, Dow Corning.
   b. SCS 1700 Sanitary Sealant, General Electric.
   c. 898 Silicone Sanitary Sealant, Pecora Corporation.

C. Acrylics, Latex:
   1. Type 1: One-Part Acrylic Latex, Non-Sag, ASTM-C-834-76.
      a. Chem-Calk 600, by Bostik.
      b. LC-130, by MACCO Adhesives, The Glidden Company.
      c. Easa-ply ALS, by W. R. Meadows, Inc.
      d. AC-20+Silicone Acrylic Latex, by Pecora Corporation.
      e. Sonolac, Sonneborn Building Products, ChemRex Inc.

D. Acoustical Sealants:
   1. Type 1: AC-20 FTR Acoustical and Insulation Sealant, by Pecora Corporation.
   2. Type 2: 60+ Unicrylic, by Pecora Corporation.
   3. Type 3: Sheetrock Acoustical Sealant, by United States Gypsum.

E. Butyls:
   1. Type 1: One-Part Butyl, Non-Sag, FS TT-S-1657.
      a. Chem-Calk 300, by Bostik.
      b. BC-158 Butyl Rubber, by Pecora Corporation. (ASTM C1085)

F. Preformed Compressible & Non-Compressible Fillers:
   1. Type 1: Backer Rod - Closed cell polyethylene foam:
      a. HBR Backer Rod, by Nomaco.
      b. #92 Greenrod, by Nomaco.
      c. Sonofoam Closed-Cell Backer Rod, Sonneborn Building Products, ChemRex Inc.
   2. Type 2: Backer Rod - Open cell polyurethane foam:
      a. Denver Foam, by Backer Rod Mfg Inc.
      b. Foam Pack II, by Nomaco.
   3. Type 3: Neoprene compression seals:
      a. WE, WF, and WG Series, by Watson Bowman & Acme Corp.
      b. Will-Seal 150 Precompressed Expanding Foam Sealants, by Will-Seal, a Division of Illbruck.
   4. Type 4: Butyl Rod: Kirkhill Rubber Co. (714)529-4901.

G. Bond Breaker Tape: Polyethylene tape of plastic as recommended by sealant manufacturer, to be applied to sealant-contact surfaces where bond to substrate of joint filler must be avoided for proper performance of sealant

2.3 COLORS

A. Generally use sealant colors matching color of material joint is located in.

   Where a joint occurs between two materials of differing colors and Contractor cannot determine which material to match, contact Architect / Engineer for selection.

2.4 ACCESSORIES

A. Joint Cleaner: Provide type of non-corrosive and non-staining joint cleaning compound recommended by sealant manufacturer for joint surfaces to be cleaned.

B. Primer: Non-staining as recommended by sealant manufacturer.

C. Masking tape and similar accessories to protect surfaces from damage.

D. Joint Backing:
   1. Round foam rod, compatible with sealant.
   2. Size: Oversized 30 to 50 percent larger than joint width.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for application examination.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive Work.
   1. Verify that joint widths are in conformance with sealant manufacturer allowable limits.
   2. Verify that contaminants capable of interfering with adhesion have been cleaned form joint and joint properly prepared.
   3. Verify that joint backing and release tapes are compatible with sealant.

C. Report in writing to Architect / Engineer prevailing conditions that will adversely affect satisfactory execution of the Work of this Section. Do not proceed with Work until unsatisfactory conditions have been corrected.

D. By beginning Work, Contractor accepts conditions and assumes responsibility for correcting unsuitable conditions encountered at no additional cost to the Owner.

3.2 PREPARATION

A. Section 01 70 00 – Execution and Closeout Requirements: Requirements for application preparation.

B. Comply with ASTM C1193.

C. Clean and prime joints.

D. Prepare and size joints in accordance with manufacturer's instructions. Clean substrates of dirt, laitance, dust, or mortar using solvent, abrasion, or sandblasting as recommended by manufacturer. Remove loose materials and foreign matter which might impair adhesion of sealant.

E. Verify that joint backing and release tapes are compatible with sealant. Verify sealant is suitable for substrate. Verify that sealant is paintable if painted finish is indicated.

F. Protect materials surrounding work of this Section from damage or disfiguration.

3.3 INSTALLATION

A. Comply with ASTM C1193.

B. Install sealant in accordance with manufacturer's published instructions.

C. Prime or seal joint surfaces where recommended by sealant manufacturer. Do not allow primer or sealer to spill or migrate onto adjoining surfaces.

D. Install backer rod and bond breaker tape where required by manufacturer.

E. Install preformed compressible and non-compressible fillers in accordance with manufacturer's published instructions.

F. Install sealants to depths recommended by sealant manufacturer in uniform, continuous ribbons free of air pockets, foreign embedded matter, ridges, and sags, "wetting" joint bond surfaces equally on both sides.

G. Tool joints concave unless shown otherwise. Where horizontal joints are between a horizontal surface and a vertical surface, fill joint to form slight cove so that joint will not trap moisture and foreign matter. Dry tool joints. Do not use soap, water, or solvent to tool joints.

3.4 CURING

A. Cure sealants in compliance with manufacturer's published instructions.

3.5 CLEANING

A. Section 01 70 00 – Execution and Closeout Requirements: Requirements for protecting finished Work.

B. Remove excess and spillage of sealants promptly as the work progresses, using materials and methods as recommended by sealant and substrate manufacturers. Clean adjoining surfaces to eliminate evidence of spillage without damage to adjoining surfaces or finishes.

3.6 SEALANT SCHEDULE

A. Exterior Joints:
   1. Perimeters of exterior openings where frames and other penetrations meet exterior facade of building: precast concrete, brick, CMU, polymer reinforced concrete.
      a. Sealant Urethane Type 2
      b. Sealant Silicone Type 1 (for prefinished materials only)
   2. Expansion and control joints in exterior surfaces of cast-in-place concrete walls, precast architectural wall panels.
      a. Sealant Urethane Type 2
      b. Sealant Urethane Type 4
      c. Preformed Compressible & Non-Compressible Filler Type 1
   3. Expansion and control joints in exterior surfaces of unit masonry walls and polymer reinforced concrete, including at metal panels.
      a. Sealant Urethane Type 2
   4. Coping joints, coping-to-facade joints, cornice and wash, or horizontal surface joints not subject to foot or vehicular traffic.
      a. Sealant Urethane Type 2
      b. Sealant Urethane Type 4
      c. Sealant Silicone Type 1 (for prefinished materials only)
   5. Exterior joints in horizontal wearing and non-wearing surfaces.
      a. Sealant No. Urethane Type 1
      b. Sealant No. Urethane Type 3
      c. Preformed Compressible & Non-Compressible Filler Type 1
   6. Paving joints and curbs.
      a. Sealant Urethane Type 4
      b. Paving Sealant Type 2
   7. Setting bed for threshold and saddles.
      a. Sealant Acoustical Type 1
   8. Painted metal lap or flashing joints.
      a. Sealant Silicone Type 1

B. Interior Joints:
   1. Seal interior perimeters of exterior openings.
   2. Perimeters of interior hollow metal and aluminum frames.
   3. For all of the above interior joints:
      a. Sealant Urethane Type 2
      b. Sealant Urethane Type 4
      c. Sealant Silicone Type 1 (for prefinished materials only)
   4. Exposed interior control joints in drywall and concealed joints.
      a. Sealant Acrylic, Latex, Type 1
      b. Sealant Acoustical Type 1
      c. Sealant Acoustical Type 3
      d. Sealant Butyl Type 1
   5. Joints of underside of precast beams or planks.
      a. Sealant Urethane Type 2
      b. Sealant Urethane Type 4

6. Joints at tops of non-load bearing masonry walls at underside of cast-in-place concrete.
   a. Sealant Urethane Type 2
   b. Sealant Urethane Type 4
7. Interior expansion and control joints in floor surfaces exposed to foot traffic.
   a. Sealant Urethane Type 2
   b. Sealant Urethane Type 4
   c. Preformed Compressible & Non-Compressible Filler Type 1
8. Interior non-moving joints, including control, contraction, or construction joints, in interior floor slabs exposed to heavy duty traffic.
   a. Paving Sealant Type 1
9. Painted metal lap joints.
   a. Sealant Silicone Type 1

END OF SECTION

SECTION 08 12 14 - STANDARD STEEL FRAMES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes non-rated steel frames.
   1. Provide frames for interior glazed lights.

B. Related Sections:
   1. Section 08 13 14 - Standard Steel Doors.
   2. Section 08 14 16 – Flush Wood Doors.
   3. Section 08 71 00 - Door Hardware.
   4. Section 08 80 00 - Glazing.
   5. Section 09 90 00 – Painting and Coating: Field painting of frames.

1.2 REFERENCES

A. American National Standards Institute:
   1. ANSI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.

B. ASTM International:
   1. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

C. National Fire Protection Association:
   1. NFPA 80 - Standard for Fire Doors, Fire Windows.
   2. NFPA 105 - Standard for the Installation of Smoke Door Assemblies and other Opening Protectives.
   3. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.

D. Underwriters Laboratories Inc.:
   1. UL 10B - Fire Tests of Door Assemblies.
   2. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
   3. UL 1784 - Air Leakage Tests of Door Assemblies.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Shop Drawings: Indicate frame elevations, reinforcement, anchor types and spacing, location of cut-outs for hardware, and finish.

C. Product Data: Submit frame configuration and finishes.

D. Manufacturer's Installation Instructions: Submit special installation instructions.

E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

A. Conform to requirements of ANSI A250.8.

1.5 QUALIFICATIONS

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

1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

B. Accept frames on site in manufacturer's packaging. Inspect for damage.

C. Break seal on-site to permit ventilation.

1.7 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Coordinate Work with frame opening construction, door, and hardware installation.

C. Sequence installation to accommodate required door hardware electric wire connections.

PART 2 PRODUCTS

2.1 STANDARD STEEL FRAMES

A. Manufacturers:
   1. Amweld Building Products, Inc.
   2. Ceco Door Products.
   3. Republic Builders Products.
   4. Steelcraft.
   5. Curries Company.
   6. Mesker Door Inc.
   7. Substitutions: Not Permitted.

B. Provide all standard steel doors and standard steel frames from a single manufacturer.

C. Product Description: Standard shop fabricated steel frames, non-rated types.
   1. Interior Frames: Zinc-Iron Alloy-Coated galvannealed steel, ASTM A 653, Class A60, 16 gage/0.053 inch galvannealed steel.

D. Include galvannealed components and internal reinforcements with galvannealed frames.

2.2 ACCESSORIES

A. Removable Stops: Rolled steel channel shape, mitered corners; prepared for countersink style tamper proof screws and as required for fire ratings indicated.

B. Primer: ANSI A250.10 rust inhibitive type.

C. Silencers: Resilient rubber fitted into drilled hole.

D. Weatherstripping: Specified in Section 08 71 00.

2.3 FABRICATION

A. Fabricate frames as welded unit. Knock down frames shall not be acceptable without written permission from Architect / Engineer.

B. Mullions for Double Doors: Keyed removable type, of same profiles as jambs as specified in Section 08 71 00.

C. Transom Bars for Glazed Lights: Fixed type, of same profiles as jamb and head.

D. Fabricate frames with hardware reinforcement plates welded in place. Provide mortar guard boxes.

E. Reinforce frames wider than 48 inches with roll formed steel channels fitted tightly into frame head, flush with top.

F. Prepare frames for silencers. Provide three single silencers for single doors and mullions of double doors on strike side. Provide two single silencers on frame head at double doors without mullions.

2.4 SHOP FINISHING

A. Steel Sheet: Galvannealed to ASTM A653 A60.

B. Primer: Frames and frame components are required to be cleaned, phosphatized, and finished with one coat of baked-on rust inhibiting prime paint in accordance with the ANSI/SDI A250.10 “Test Procedures and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.”

C. Field finish per Section 09 90 00.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify opening sizes and tolerances are acceptable.

3.2 INSTALLATION

A. Install frames in accordance with ANSI A250.8.

B. Coordinate with gypsum board wall construction for anchor placement.

C. Coordinate installation of glass and glazing specified in Section 08 80 00.

D. Coordinate installation of frames with installation of hardware specified in Section 08 71 00 and doors in Section 08 13 14, and 08 14 16.

3.3 ERECTION TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Maximum Diagonal Distortion: 1/16 inch measured with straight edges, crossed corner to corner.

3.4 SCHEDULE

A. Refer to Door and Frame Schedule on Drawings.

END OF SECTION

SECTION 08 13 14 - STANDARD STEEL DOORS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes non-rated steel doors.

B. Related Sections:
1. Section 08 12 14 - Standard Steel Frames.
2. Section 08 71 00 - Door Hardware.
3. Section 08 80 00 - Glazing: Glass for doors.
4. Section 09 90 00 - Painting and Coating: Field painting of doors.

1.2 REFERENCES

A. American National Standards Institute:
1. ANSI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.

B. ASTM International:
1. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
2. ASTM C1363 - Standard Test Method for the Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
4. ASTM E413 - Classification for Rating Sound Insulation.

C. Hollow Metal Manufacturers Association:
1. HMMA 810 - Hollow Metal Doors.

D. National Fire Protection Association:
1. NFPA 80 - Standard for Fire Doors, Fire Windows.
2. NFPA 105 - Standard for the Installation of Smoke Door Assemblies and other Opening Protectives.
3. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.

E. Steel Door Institute:
1. SDI 108 - Recommended Selection and Usage Guide for Standard Steel Doors.

F. Underwriters Laboratories Inc.:
1. UL 10B - Fire Tests of Door Assemblies.
2. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
3. UL 1784 - Air Leakage Tests of Door Assemblies.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Shop Drawings: Indicate door elevations, internal reinforcement, closure method, and cut-outs for glazing, and finishes.

C. Product Data: Submit door configurations, location of cut-outs for hardware reinforcement.

D. Manufacturer's Installation Instructions: Submit special installation instructions.

E. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with ANSI A250.8.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Accept doors on site in manufacturer's packaging. Inspect for damage.

C. Break seal on site to permit ventilation.

1.7 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Requirements for coordination.

B. Coordinate Work with door opening construction, door frame, and door hardware installation.

C. Coordinate installation to accommodate door hardware electric wire connections.

PART 2 PRODUCTS

2.1 STANDARD STEEL DOORS

A. Manufacturers: (all hollow metal doors and frames shall be from the same manufacturer).
   1. Amweld Building Products, Inc.
   2. Ceco Door Products.
   3. Republic Builders Products.
   4. Steelcraft.
   5. Curries.
   6. Mesker Door Inc.
   7. Substitutions: Not permitted.

B. Product Description:
   1. Interior Doors (Non-Rated): ANSI A250.8, SDI 108, 1-3/4 inch thick.
      a. Level 2 - Heavy Duty, Model 2, seamless design.

2.2 COMPONENTS

A. Face: Steel sheet in accordance with ANSI A250 and SDI 108.

B. End Closure: Channel, 0.04 inches thick, flush.

C. Core: Steel channel grid and vertical steel stiffeners.

2.3 ACCESSORIES

A. Removable Stops: Rolled steel, channel shape, mitered corners; prepared for countersink style tamper proof screws.

B. Primer: ANSI A250.10 rust inhibitive type.

2.4 FABRICATION

A. Fabricate doors with hardware reinforcement welded in place.

B. Attach astragal to inactive leaf of pairs of fire rated doors.

2.5 SHOP FINISHING

A. Steel Sheet: Galvannealed to ASTM A653 A60.

B. Primer: Frames and frame components are required to be cleaned, phosphatized, and finished with one coat of baked-on rust inhibiting prime paint in accordance with the ANSI/SDI A250.10 “Test Procedures and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.”

C. Field finish as specified in Section 09 90 00.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting Work.

B. Verify opening sizes and tolerances are acceptable.

3.2 INSTALLATION

A. Install doors in accordance with ANSI A250.8.

B. Coordinate installation of glass and glazing specified in Section 08 80 00.

C. Coordinate installation of doors with installation of frames specified in Section 08 12 14 and hardware specified in Section 08 71 00.

D. Touch-up damaged shop finishes.

3.3 ERECTION TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.4 ADJUSTING

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for adjusting.

B. Adjust door for smooth and balanced door movement.

3.5 SCHEDULE

A. Refer to Door and Frame Schedule on Drawings.

END OF SECTION

SECTION 08 14 16 - FLUSH WOOD DOORS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes flush wood doors; flush and flush glazed configuration; non-rated.

B. Related Requirements:
1. Section 08 12 14 - Standard Steel Frames.
2. Section 08 71 00 - Door Hardware.
3. Section 08 80 00 - Glazing.
4. Section 09 90 00 - Painting and Coating: Touch-up of factory finish.

1.2 REFERENCE STANDARDS

A. American National Standards Institute:
1. ANSI A135.4 - Basic Hardboard.

B. ASTM International:
1. E413 - Classification for Rating Sound Insulation.

C. Architectural Woodwork Institute:
1. AWI AWS - Architectural Woodwork Standards 1st edition (2009).

D. Hardwood Plywood and Veneer Association:
1. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood.

E. Intertek Testing Services (Warnock Hersey Listed):
1. ITS-WH – Certification Listings.

F. National Fire Protection Association:
1. NFPA 80 - Standard for Fire Doors, Fire Windows.
2. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.

G. Underwriters Laboratories Inc.:
1. UL – Building Materials Directory.
2. UL 10B – Fire Tests of Door Assemblies.
3. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
4. UL 1784 - Air Leakage Tests of Door Assemblies.

H. Wood Window and Door Manufacturers Association:
1. WDMA I.S 1A - Architectural Wood Flush Doors.

1.3 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Coordinate Work with door opening construction, door frame and door hardware installation.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Product Data:
   1. Submit data for door core materials and construction.
   2. Submit data for veneer species, type and characteristics.
   3. Submit data for factory finishes.

C. Shop Drawings:
   1. Indicate door opening criteria, elevations, sizes, types, swings, undercuts required, special beveling, special blocking for hardware, and factory machining criteria.
   2. Indicate cutouts for glazing.

D. Samples:
   1. Submit two samples of door veneer, 6 x 6 inch in size illustrating wood grain, stain color, and sheen.

E. Manufacturers' Instructions: Submit special installation instructions.

F. Manufacturer’s Certificate: Certify products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with AWI AWS Custom Grade.

B. Finish doors in accordance with AWI AWS Custom Grade.

1.6 QUALIFICATIONS

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

1.7 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

B. Package, deliver and store doors in accordance with AWI AWS Section 2.

C. Accept doors on site in manufacturer's packaging. Inspect for damage.
   1. Break seal on site to permit ventilation.

1.8 WARRANTY

A. Section 01 70 00 - Execution and Closeout Requirements: Product warranties and product bonds.

B. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction. Include reasonable costs of re-finishing and re-installation.

C. Interior Doors:
   1. Factory Finished Doors: Furnish manufacturer's life of installation warranty.

PART 2 PRODUCTS

2.1 FLUSH WOOD DOORS

A. Manufacturers:
   1. Eggers Industries.
   2. Algoma Hardwoods Inc.
   3. Graham Manufacturing Corp.
   4. Marshfield Door Systems.
   5. Oshkosh Door Company.
   6. VT Industries.
   7. Section 01 60 00 – Not Permitted.

B. Flush Interior Doors: Solid core flush wood doors; wood veneer facing material; non-rated types; flush design; without louvers; factory pre-fit; and factory finished.
   1. Flush Interior Doors: 1-3/4 inches thick, unless noted otherwise on Drawings; solid core, five ply construction, fire rated as indicated on Drawings.
   2. Color: As selected by Architect / Engineer from manufacturer's full range of color selections.

2.2 MATERIALS

A. Door Cores: AWI AWS Section 9.
   1. Solid Core, Non-Fire Rated:
      a. Type: PC; particleboard.

B. Interior Door Faces: AWI AWS Section 4.
   1. Hardwood wood veneer, plain sliced, book matched grain, for transparent finish. Pair match multiple door leaves in single opening.
      a. Species: White Birch.

C. Facing Adhesive: Type I – water proof.

2.3 FABRICATION

A. Fabricate doors in accordance with AWI AWS Section 9 requirements.

B. Furnish blocking as needed to eliminate through bolt holes and maintain warranty.

C. Vertical Exposed Edge of Stiles: Hardwood of same species and finish as veneer facing.

D. Bond stiles and rails to core and sand flat prior to application of cross band and face veneer.

E. Factory machine doors for finish hardware in accordance with hardware requirements and dimensions. Do not machine for surface hardware.

F. Factory fit doors for frame opening dimensions identified on shop drawings.

G. Provide edge clearances in accordance with AWI AWS Section 9.

2.4 FINISHES

A. Finish work in accordance with AWI AWS Section 5; Custom Grade.

B. Transparent Finish System: Stained, transparent color; satin sheen, as indicated.
   1. System 9; UV curable polyester, urethane.

C. Factory finish doors in accordance with approved sample.

D. Factory seal door top edge with clear sealer. Re-seal in field if field fitting is required.

2.5 ACCESSORIES

A. Door Glazing:
   1. Glass: As specified in Section 08 80 00.
   2. Glazing Stops: Wood, of same species as door facing with metal clips for rated doors.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify opening sizes and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.2 INSTALLATION

A. Install doors in accordance with AWI AWS Section 9, manufacturer's instructions, NFPA 80, and ITS-WH/UL requirements.

B. Field Fitting and Trimming:
   1. Trim non-rated door width by cutting equally on both jamb edges.
   2. Trim door height by cutting bottom edges to maximum of 3/4 inch.
   3. Machine cut doors for hardware installation.

C. Coordinate installation of doors with installation of frames specified in Section 08 12 14 and hardware specified in Section 08 71 00.

D. Coordinate installation of glass and glazing specified in Section 08 80 00.

3.3 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Conform to AWI AWS Section 9 requirements for fit and clearance tolerances and WDMA standards and testing methods for warp, cup, bow and telegraphing.

3.4 ADJUSTING

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for starting and adjusting.

B. Adjust door for smooth and balanced door movement. Adjust door closer for full closure.

3.5 SCHEDULE

A. Refer to Door and Frame Schedule on Drawings.

END OF SECTION

SECTION 08 71 00 - DOOR HARDWARE

PART 1 GENERAL

1.1 SUMMARY

A. Section includes hardware for wood and steel doors.

B. Related Sections:
1. Section 08 12 14 - Standard Steel Frames: Silencers integral with steel frames.
2. Section 08 13 14 - Standard Steel Doors.
3. Section 08 14 16 - Flush Wood Doors.

1.2 REFERENCES

A. American National Standards Institute:
1. ANSI A156.1 - Butts and Hinges.
2. ANSI A156.2 - Bored and Preassembled Locks and Latches.
3. ANSI A156.3 - Exit Devices.
4. ANSI A156.4 - Door Controls - Closures.
5. ANSI A156.5 - Auxiliary Locks and Associated Products.
6. ANSI A156.6 - Architectural Door Trim.
7. ANSI A156.7 - Template Hinge Dimensions.
8. ANSI A156.8 - Door Controls - Overhead Holders.
9. ANSI A156.12 - Interconnected Locks and Latches.
10. ANSI A156.15 - Closer Holder Release Devices.
11. ANSI A156.16 - Auxiliary Hardware.
12. ANSI A156.18 - Materials and Finishes
13. ANSI A156.19 - Power Assist and Low Energy Power Operated Doors.
14. ANSI A156.23 - Electromagnetic Locks.
15. ANSI A156 - Complete Set of 24 BHMA Standards (A156 Series) with Binder.

B. Builders Hardware Manufacturers Association:
1. BHMA Directory of Certified Products.

C. National Fire Protection Association:
1. NFPA 80 - Standard for Fire Doors, Fire Windows.
2. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.

D. Underwriters Laboratories Inc.:
1. UL 10B - Fire Tests of Door Assemblies.
2. UL 305 - Panic Hardware.
3. UL - Building Materials Directory.

E. Intertek Testing Services (Warnock Hersey Listed):
1. WH - Certification Listings.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Shop Drawings:
   1. Indicate locations and mounting heights of each type of hardware, schedules, catalog cuts, electrical characteristics and connection requirements.
   2. Submit manufacturer's parts lists, and templates.

C. Manufacturer's Installation Instructions: Submit special procedures, and perimeter conditions requiring special attention.

D. Keys and Keying:
   1. All keying nomenclature shall be prepared using symbols, nomenclature and overall method as described in ASAHC NBHA Handbook – AIA File.
   2. Hardware supplier shall provide keying in accordance with instructions of Owner and Architect/Engineer, including three keys for each lock and six master keys.
   3. Before hardware is ordered, a complete keying schematic drawing shall be furnished to Architect/Engineer for approval.
   4. All bitting records shall be delivered to Owner for use/reference on future projects.

1.4 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.

B. Project Record Documents: Record actual locations of installed cylinders and their master key code.

C. Operation and Maintenance Data: Submit data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

D. Keys: Deliver with identifying tags to Owner by security shipment direct from hardware supplier.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with the following requirements:
   1. ANSI A156 series.
   2. NFPA 80.
   3. UL 305.

B. Furnish hardware marked and listed in BHMA Directory of Certified Products.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum ten years experience.

B. Hardware Supplier: Company specializing in supplying commercial and institutional door hardware with minimum ten years documented experience.

C. Hardware Supplier Personnel: Employ Architectural Hardware Consultant (AHC) to assist in work of this section.

1.7 PRE-INSTALLATION MEETINGS

A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.

B. Convene minimum one week prior to commencing work of this section.

C. Include persons involved with installation of doors, frames, and hardware.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

B. Package hardware items individually with necessary fasteners, instructions, and installation templates, when necessary; label and identify each package with door opening code to match hardware schedule.

1.9 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Coordinate Work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.
   1. Provide templates or actual hardware as required to ensure proper preparation of doors and frames.

C. Sequence installation to accommodate required utility connections.

D. Coordinate Owner's keying requirements during course of Work.

1.10 WARRANTY

A. Section 01 70 00 - Execution and Closeout Requirements: Product warranties and product bonds.

B. Furnish five year manufacturer warranty for locksets and door closers.

1.11 MAINTENANCE MATERIALS

A. Section 01 70 00 - Execution and Closeout Requirements: Maintenance materials.

B. Furnish special wrenches, tools, and accessories applicable for each different and for each special hardware component supplied by hardware component manufacturer.

PART 2 PRODUCTS

2.1 DOOR HARDWARE

A. Manufacturers: Catalog numbers of manufacturers listed have been used to establish quality required. Only manufacturers listed in Paragraph B below are approved. Other manufacturers seeking approval shall do so in writing per General Requirements and shall list exact catalog numbers and description of items he proposes to furnish; include reference to this specification section for equal product reference; include cut sheets.

B. Designations: Following abbreviations identify listed manufacturers.
1. BAL Baldwin Hardware Mfg. Corp., Reading, PA.
2. BES Best Access Systems, Indianapolis, IN.
3. COR Corbin-Russwin Architectural Hardware, Berlin, CT.
4. DOR Dorma Architectural Hardware, Reamstown, PA.
5. GJ Glynn-Johnson, Div. of Dayton-Walter Corp, Chicago, IL.
6. HAG Hager Hinge Co., St. Louis, MO.
7. HOR Horton Automatics, Corpus Christi, TX.
8. IVE Ives, Div. of Leigh Products, New Haven, CT.
9. LAW Lawrence Brothers, Inc., Sterling, IL.
10. LCN LCN Closer, Princeton, IL.
11. MCK McKinney Products Co., Scranton, PA.
12. NAT National Guard Products, Memphis, TN.
13. NOR Norton Door Controls, Charlotte, NC.
14. PEM Pemko, Ventura, CA.
15. RED Reed Exit Hardware, Charlotte, NC.
16. REE Reese Enterprises, Inc., Rosemount, MN.
17. RIX Rixson-Firemark, Franklin Park, IL.
18. ROC Rockwood Manufacturing Co., Rockwood, PA.
19. SAR Sargent, Div. of Kidde, New Haven, CT.
20. SCH Schlage Lock Co., Palatine, IL.
21. STA Stanley Hardware, New Britain, CT.
22. VON Von DuPrin, Indianapolis, IN.
23. FAL Falcon Lock.

2.2 COMPONENTS

A. General Hardware Requirements: Where not specifically indicated, comply with applicable ANSI A156 standard for type of hardware required. Furnish each type of hardware with accessories as required for applications indicated and for complete, finished, operational doors.
1. Templates: Furnish templates or physical hardware items to door and frame manufacturers sufficiently in advance to avoid delay in Work.
2. Reinforcing Units: Furnished by door and frame manufacturers; coordinated by hardware supplier or hardware manufacturer.
3. Fasteners: Furnish as recommended by hardware manufacturer and as required to secure hardware.
4. Finish: Match hardware item being fastened.

B. Hinges: Continuous hinge, manufactured of 6063-T6 aluminum.
   1. Components: Two interlocking geared leaves and a cover channel applied the full length of the door without mortising (concealed).
      a. Ensure separation of different metals to avoid galvanic corrosion.

C. Locksets: Furnish locksets compatible with specified cylinders. Typical 2-3/4 inch backset for interior doors and 3-3/4 inch backset for exterior doors. Furnish standard strikes with extended lips to protect trim from being marred by latch bolt.
   1. Bored (Cylindrical) Locksets: ANSI A156.2, Series 4000, Grade 1 unless otherwise indicated.
   2. Auxiliary Locksets: ANSI A156.5, Grade 1, mortise dead locks unless otherwise indicated.

D. Exit Devices: ANSI A156.3, Grade 1 surface mounted rim type, with push pad, unless otherwise indicated. Furnish standard strikes with extended lips to protect trim from being marred by latch bolt.
   1. Types: Suitable for doors requiring exit devices.
   2. All exit devices shall be UL listed for panic. Exit devices for labeled doors shall be UL listed as "Fire Exit Hardware".
   3. Provide exit devices factory cut to door width and height. Locate exit devices at a height recommended by the exit device manufacturer, allowable by governing building codes, and approved by the Architect/Engineer.
   4. Provide weatherseal gasketing at exterior applications.
   5. Provide cylinder-dogging feature for exit devices.

E. Cylinders: ANSI A156.5, Graded 1, 6 pin type cylinders.
   1. Keying: Keyed as directed by Owner. New master keying system to be built into existing grand master system.
   2. Include construction keying for contractor access prior to substantial completion.
   3. Keys: Nickel silver. Stamp keys with "DO NOT DUPLICATE".
   4. Supply keys in the following minimum quantities:
      a. 6 master keys.
      b. 3 grand master keys.
      c. 3 great grand master keys.
      d. 10 construction keys.
      e. 5 control keys.

F. Closers: ANSI A156.4 modern type with cover, surface mounted closers; full rack and pinion type with steel spring and non-freezing hydraulic fluid; closers required for fire rated doors unless otherwise indicated.
   1. Adjustability: Furnish controls for regulating closing, latching, speeds, and back checking.
   2. Arms: Type to suit individual condition; parallel-arm closers at reverse bevel doors and where doors swing full 180 degrees.
   3. Location: Mount closers on inside of exterior doors, room side of interior doors typical; mount on pull side of other doors.
   4. Operating Pressure: Maximum operating pressure as follows.
      a. Interior Doors: Maximum 5 pounds.

G. Miscellaneous Hardware: Furnish as indicated in Schedule, with accessories as required for complete operational door installations.
   1. Kickplates: ANSI A156.6, metal; height indicated in Schedule by 2 inch less than door width; minimum 0.050 inch thick stainless steel.
   2. Thresholds: Maximum 1/2 inch height.
   3. Wall Stops: ANSI A156.1, Grade 1, concave pad wall stop with no visible screws.
   4. Electric Strikes: ANSI A156.5, stainless steel construction; non-handed, fail safe.

2.3 ACCESSORIES

A. Lock Trim: Furnish levers as indicated in Schedule.
   1. Do not permit through bolts on solid wood core doors.

B. Through Bolts: Do not permit through bolts and grommet nuts on door faces in occupied areas unless no alternative is possible.
   1. Do not use through bolts on solid wood core doors.

2.4 FINISHING

A. Finishes: ANSI A156.18; furnish following finishes except where otherwise indicated in Schedule at end of section.
   1. Typical Exterior Exposed and High Use Interior Door Hardware:
      a. BHMA 630, satin finished stainless steel.
      b. BHMA 626, satin chromium plated brass or bronze.
   2. Typical Interior Door hardware:
      a. BHMA 626, satin chromium plated brass or bronze.
      b. BHMA 630, satin finished stainless steel.
   3. Closers: Finish appearance to match door hardware on same face of door.
      a. BHMA 628, satin aluminum, clear anodized.
   4. Thresholds: Finish appearance to match door hardware on exterior face of door.
      a. BHMA 628, satin aluminum, clear anodized.
      b. BHMA 630, satin finished stainless steel.
   5. Other Items: Furnish manufacturer's standard finishes to match similar hardware types on same door, and maintain acceptable finish considering anticipated use and BHMA category of finish.

2.5 PRODUCTS

A. Hinges:
   1. Hinges: Continuous, geared aluminum, heavy duty, concealed left 180 degree opening, clear anodized aluminum.
      a. Manufacturers:
         1) HAG – 780-112HD.
         2) MCK – 12 HD.
         3) PEM – CFM83 SLFHD.
         4) FAL – 112HD.

B. Locksets (lockset manufacturer shall be responsible for guarantee that their locksets are compatible with all specified and Owner existing keying system and required cores, cylinders, etc.):
   1. Lockset: Cylindrical, heavy duty, storeroom function (F86).
      a. Manufacturer:
         1) SCH – ND 80 PD –RHO.
         2) COR – CL3300 series equal to SCH.
         3) SAR – 10-Line series equal to SCH.
         4) YAL – 5400LN series equal to SCH.
         5) FAL – T Series equal to SCH
   2. Lockset: Cylindrical, heavy duty, office function (F82).
      a. Manufacturer:
         1) SCH - ND 91 PD -RHO.
         2) COR – CL3300 series equal to SCH.
         3) SAR – 10-Line series equal to SCH.
         4) YAL – 5400LN series equal to SCH.
         5) FAL – T Series equal to SCH.

C. Exit Devices: (Lockset manufacturer shall provide cylinders for exit devices).
   1. Touch bar, surface mount, rim type, lever handle, interchangeable core, US26D X US32D push bar.
      a. Manufacturers:
         1) VON – 99L.
         2) COR – ED5200 X N9.
         3) SAR – 8810 X ETL.

D. Closers:
   1. Closer: Universal, non-handed, parallel arm with built-in cushioned stop.
      a. Manufacturer:
         1) LCN – 4041 Series with Spring Cush Arm.
         2) COR – DC8200 X A11 Series.
         3) SAR – 281-CPS Series.
         4) FAL – SC70 Series.

E. Stops:
   1. Door Stop: Wall mount.
      a. Manufacturer:
         1) BAL – 4290 Series.
         2) GJ – 60W.
         3) IVE – Approved equal.
         4) SAR – Approved equal.

F. Thresholds:
   1. Flat saddle, aluminum, 6 inches x ½ inch.
      a. Manufacturer:
         1) NAT – 426.
         2) PEM – 172A
         3) REE – S206A.

G. Kickplates:
   1. Kickplate: Stainless steel, 0.050 inch thick, beveled three sides, 12 inches high x 2 inches less door width.
      a. Manufacturer:
         1) IVE – 8400 Series.
         2) HAG – 193S Series.

H. Cylinders:
   1. Cylinder, 6 pin.
      a. Manufacturer:
         1) As required to match Owner's existing keying system.
            a) Contractor to provide temporary construction cylinders and cores.
            b) Contractor to provide all final cylinders and cores.
            c) Owner to provide keying.

I. Removable Mullion:
   1. Keyed removable mullion, steel, with strikes.
      a. Manufacturer:
         1) VON – KR 4954.

J. Electric Strikes:
   1. Fail secure, entry buzzer type operation.
      a. Manufacturer:
         1) VON – 6211 FSE EB.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify doors and frames are ready to receive door hardware and dimensions are as indicated on shop drawings.

C. Verify electric power is available to power operated devices and is of correct characteristics.

3.2 INSTALLATION

A. Coordinate mounting heights with door and frame manufacturers. Use templates provided by hardware item manufacturer.

B. Mounting Heights From Finished Floor to Center Line of Hardware Item: Comply with manufacturer recommendations and applicable codes where not otherwise indicated.
   1. Locksets: 38 inch.
   2. Push Pad Type Exit Devices: 42 inch.

3.3 FIELD QUALITY CONTROL

A. Section 01 70 00 - Execution Requirements: Testing, adjusting, and balancing.

B. Architectural Hardware Consultant inspect installation and certify hardware and installation has been furnished and installed in accordance with manufacturer's instructions and as specified.

3.4 ADJUSTING

A. Section 01 70 00 - Execution Requirements: Testing, adjusting, and balancing.

B. Adjust hardware for smooth operation.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

A. Section 01 70 00 - Execution Requirements: Protecting installed construction.

B. Do not permit adjacent work to damage hardware or hardware finish.

3.6 SCHEDULES

A. The following hardware sets are intended to establish type and standard of quality when used together with these section requirements. **Equal products from other manufacturers approved in Part 2 are acceptable. Equal products shall be compatible with all other components of hardware sets (including items indicated "No Substitutions"), and Owner's specified cylinder, core and keying system.** Examine Drawings and Specifications **and furnish proper hardware** for door openings.

B. Where a pair of doors is installed, items listed are per leaf, except locks where inactive door is listed.
   1. Group 1:
      a. Door 101:
         1) Hinge: #1.
         2) Exit Device: #1.
         3) Closer: #1.
         4) Stop: #1.
         5) Removable Mullion: #1.
   2. Group 2:
      a. Door 102:
         1) Hinge: #1.
         2) Lockset: #1.
         3) Closer: #1.
         4) Threshold: #1.
         5) Kickplate: #1.
         6) Electric Strike: #1.
         7) Fob Reader: By Security Alarm Corp.

3. Group 3:
    a. Doors 103 and 104.
        1) Hinge: #1.
        2) Lockset: #2.
        3) Stop: #1.
4. Group 4:
    a. Door 105:
        1) Hinge: #1.
        2) Lockset:
        3) Closer: #1.
        4) Kickplate: #1.
        5) Electric Strike: #1.

END OF SECTION

SECTION 08 80 00 - GLAZING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes glass glazing, rated and non-rated for hollow metal frames, doors, glazed walls, aluminum curtain walls, and aluminum storefronts.

B. Related Sections:
1. Section 07 90 00 - Joint Protection: Sealant and back-up material other than glazing sealants.
2. Section 08 13 14 - Standard Steel Doors: Glazed doors.
3. Section 08 12 14 - Standard Steel Frames: Glazed frames.
4. Section 08 14 16 - Flush Wood Doors: Glazed doors.

1.2 REFERENCES

A. American National Standards Institute:
1. ANSI Z97.1 - Safety Glazing Materials Used in Buildings Safety.

B. American Society of Civil Engineers:
1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

C. ASTM International:
1. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
2. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
3. ASTM C1036 - Standard Specification for Flat Glass.
4. ASTM C1048 - Standard Specification for Heat-Treated Flat Glass-Kind HS, Kind FT Coated and Uncoated Glass.
5. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass.
6. ASTM C1193 - Standard Guide for Use of Joint Sealants.
7. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
8. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
9. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
10. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors By Uniform Static Air Pressure Difference.
11. ASTM E576 - Standard Test Method for Frost Point of Sealed Insulating Glass Units in the Vertical Position.
12. ASTM E773 - Standard Test Methods for Seal Durability of Sealed Insulating Glass Units.
13. ASTM E774 - Standard Specification for Sealed Insulating Glass Units.

D. Consumer Products Safety Commission:
1. CPSC 16 CFR 1201 - Safety Standard for Architectural Glazing.

E. Glass Association of North America:
   1. GANA - Sealant Manual.
   2. GANA - Glazing Manual.

F. National Fire Protection Association:
   1. NFPA 80 - Standard for Fire Doors, Fire Windows.
   2. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.

G. Underwriters Laboratories Inc.:
   1. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
   2. UL - Building Materials Directory.

1.3 PERFORMANCE REQUIREMENTS

A. Provide glass and glazing materials for continuity of building enclosure vapor retarder and air barrier:
   1. To utilize inner pane of multiple pane sealed units for continuity of air barrier and vapor retarder seal.
   2. To maintain continuous air barrier and vapor retarder throughout glazed assembly from glass pane to heel bead of glazing sealant.

B. Exterior Glass Deflection: Maximum of 1/175 of glass edge length or 3/4 inch, whichever is less with full recovery of glazing materials.

C. Interior Glass Deflection: Design glass partition system to withstand live loads in accordance with 2009 International Building Code with maximum L/120 deflection.

D. Interior glass at full height glazed partitions shall comply with CPSC 16 CFR 1201 Category II.

E. Structural Design: Design in accordance with 2009 International Building Code for most critical combination of wind, seismic, and dead loads.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Product Data:
   1. Glass: Provide structural, physical, and thermal and solar optical performance characteristics, size limitations, special handling or installation requirements.
   2. Glazing Sealants, Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify full range of available colors where exposed.

C. Design Data:
   1. Submit design calculations for glass resisting wind loads and live loads signed and sealed by a professional engineer licensed in the State of Illinois.

D. Samples:
   1. Glass: Submit two samples 12 x 12 inch in size, illustrating each glass units, coloration and design.
   2. Glazing Materials: Submit 12 inch long bead of glazing sealant and gaskets, color as selected.

E. Manufacturer's Certificate: Certify sealed insulating glass, meets or exceeds specified requirements.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with GANA Glazing Manual for glazing installation methods.

1.6 QUALIFICATIONS

A. Installer: Company specializing in performing Work of this section with minimum three years experience.

B. Design glass resisting wind and live loads under direct supervision of Professional Engineer experienced in design of this Work and licensed in State of Illinois.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements.

B. Do not install glazing when ambient temperature is less than 50 degrees F.

C. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.8 WARRANTY

A. Section 01 70 00 - Execution and Closeout Requirements: Product warranties and product bonds.

B. Furnish ten year warranty to include coverage for sealed glass units from seal failure, interpane dusting or misting, and replacement of same.

PART 2 PRODUCTS

2.1 GLAZING

A. Manufacturers:
   1. PPG Industries, Inc.
   2. Pilkington LOF.
   3. Substitutions: Section 01 60 00 – Product Requirements.

2.2 COMPONENTS

A. Safety Glass (Type SG): CPSC 16 CFR 1201 Category II, minimum thickness 1/4 inch unless otherwise indicated. Safety glass shall be labeled and label shall be visible after glazing.
   1. Clear Tempered Glass (Type SG-CT): ASTM C1048, Kind FT Fully tempered, Condition A, uncoated, Type 1 transparent flat, Class 1 clear, Quality q3 glazing select; with horizontal tempering.
   2. Tinted Tempered Glass (Type SG-TT-1): ASTM C1048, Kind FT Fully tempered, Condition A, Type 1 transparent flat, Class 2 tinted heat-absorbing and light reducing, Quality q3 glazing select.
      a. Tint: Blue (Pacifica from PPG or equal).
   3. Tinted Tempered Glass (Type SG-TT-2): ASTM C1048, Kind FT Fully tempered, Condition C, Type 1 transparent flat, Class 2 tinted heat-absorbing and light reducing, Quality q3 glazing select with Low E coating.
      a. Tint: Blue/Gray (Solarban z50 from PPG or equal).

B. Insulated Glass Units (Type IG-1): Total unit thickness 1 inch.
   1. Double Pane Insulated Glass Units: ASTM E774 Class A and E773; with silicone sealant edge seal; purge interpane space with dry hermetic air.
      a. Outer Pane: Glass Type: SG-TT-1.
      b. Inner Pane: Glass Type SG-TT-2 with Low E coating on third glass surface form building exterior.
      c. Visible Light Transmission: 25 percent.
      d. Shading Coefficient: 0.28.
      e. Solar Heat Gain Coefficient: 0.24.
   2. Insulated Glass Unit Edge Seal Construction: Aluminum mitered and spigoted corners.

C. Clear Laminated Glass: ASTM C1172; with plastic interlayer.
   1. Clear laminated tempered glass (LG-CT): Kind LT with 2 lites of tempered glass as specified.
   2. Minimum Total Thickness: 1/4 inch for new frames and to match existing glazing thickness for replacement panes.
   3. Plastic Interlayer: Manufacturer's standard, minimum 0.060 inch thick.

2.3 ACCESSORIES

A. Elastomeric Glazing Sealants: Materials compatible with adjacent materials including glass, insulating glass seals, and glazing channels.
   1. Silicone Glazing Sealant: ASTM C920, Type S, Grade NS, Class and Use suitable for glazing application indicated; single component; chemical curing; capable of water immersion without loss of properties; non-bleeding, non-staining, cured Shore A hardness of 15 to 25.
      a. Acceptable Manufacturers and products:
         1) General Electric – "Silpruf".
         2) General Electric – "Silglaze 2400".
         3) Woodmount Products – "Chem-Caulk 1000".
         4) Dow Corning – "790".
         5) Pecora – "863".

b. Color: As selected by Architect / Engineer.
c. Structural Silicone: Furnish high-modulus structural silicone glazing materials where sealant bonds glass to substrate.

B. Glazing Gaskets: ASTM C864 Option I or II, resilient polyvinyl chloride extruded shape to suit glazing channel retaining slot.
1. Color: Black.

C. Pre-Formed Glazing Tape: Size to suit application.
1. Glazing Tape: Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 percent, designed for compression of 25 percent to effect an air barrier and vapor retarder seal.

D. Setting Blocks: ASTM C864 Option I, Neoprene, 80 to 90 Shore A durometer hardness, length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.

E. Spacer Shims: ASTM C864 Option I, Neoprene, 50 to 60 Shore A durometer hardness, minimum 3 inch long x one half the height of glazing stop x thickness to suit application, self adhesive on one face.

F. Fire-Resistant Glazing Materials: Materials used to obtain required fire-resistant rating.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify openings for glazing are correctly sized and within acceptable tolerance.

C. Verify surfaces of glazing channels or recesses are clean, free of obstructions impeding moisture movement, weeps are clear, and ready to receive glazing.

3.2 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant.

3.3 INSTALLATION

A. Perform installation in accordance with GANA Glazing Manual.
1. Glazing Sealants: Comply with ASTM C1193.
2. Fire Rated Openings: Comply with NFPA 80.

B. Interior Wet/Dry Method (Tape and Sealant) Installation:
   1. Cut glazing tape to length and install against permanent stops, projecting 1/16 inch above sight line.
   2. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
   3. Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of pane or unit.
   4. Install removable stops, spacer shims inserted between glazing and applied stops at 24 inch intervals, 1/4 inch below sight line.
   5. Fill gaps between pane and applied stop with elastomeric glazing sealant to depth equal to bite on glazing, to uniform and level line.
   6. Trim protruding tape edge.

C. Interior Wet Method (Compound and Compound) Installation:
   1. Install glazing resting on setting blocks. Install applied stop and center pane by use of spacer shims at 24-inch centers, kept 1/4 inch below sight line.
   2. Locate and secure glazing pane using glazers' clips.
   3. Fill gaps between glazing and stops with glazing compound until flush with sight line. Tool surface to straight line.

3.4 FIELD QUALITY CONTROL

A. Section 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Monitor quality of glazing.

3.5 CLEANING

A. Section 01 70 00 - Execution and Closeout Requirements: Final cleaning.

B. Remove glazing materials from finish surfaces.

C. Remove labels after Work is complete.

D. Clean glass and adjacent surfaces.

3.6 PROTECTION OF INSTALLED CONSTRUCTION

A. Section 01 70 00 - Execution and Closeout Requirements: Protecting installed construction.

B. After installation, mark pane with an 'X' by using removable plastic tape or paste.

END OF SECTION

SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Metal stud wall framing.
   2. Gypsum board and joint treatment.

B. Related Requirements:
   1. Section 06 10 53 - Miscellaneous Rough Carpentry: Wood blocking.

1.2 REFERENCE STANDARDS

A. ASTM International:
   1. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
   2. ASTM C514 - Standard Specification for Nails for the Application of Gypsum Board.
   3. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
   4. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members.
   5. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
   6. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
   7. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board.
   8. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.
   9. ASTM C1002 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases.
   10. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.
   11. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel.
   12. ASTM C1280 - Standard Specification for Application of Gypsum Sheathing.
   13. ASTM C1288 - Standard Specification for Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets.
   14. ASTM C1325 - Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cement Substrate Sheets.
   15. ASTM C1396/C1396M - Standard Specification for Gypsum Board.
   16. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
   17. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
   18. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
   19. ASTM F1667 - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.

B. American National Standards Institute:
   1. ANSI A108.11- Specifications For Interior Installations Of Cementitious Backer Units.
   2. ANSI A118.9 - Test Methods and Specifications for Cementitious Backer Units.

C. American Society of Civil Engineers:
   1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

D. Gypsum Association:
   1. GA 214 - Recommended Levels of Gypsum Board Finish.
   2. GA 216 - Application and Finishing of Gypsum Board.
   3. GA 600 - Fire Resistance Design Manual Sound Control.

E. Intertek Testing Services (Warnock Hersey Listed):
   1. WH - Certification Listings.

F. National Fire Protection Association:
   1. NFPA 265 - Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile Coverings on Full Height Panels and Walls, Method B.
   2. NFPA 286 - Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Wall and Ceiling Interior Finish.

G. Underwriters Laboratories Inc.:
   1. UL - Fire Resistance Directory.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit data on metal framing, gypsum board, joint tape, and acoustic accessories.

C. Shop Drawings:
   1. Indicate special details associated with acoustic seals.
   2. Indicate installation details required for seismic design loads.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with ASTM C840, ASTM C1280; GA-214, GA-216 and GA-600.

1.5 QUALIFICATIONS

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

B. Installer: Company specializing in performing Work of this section with minimum three years experience.

PART 2 PRODUCTS

2.1 GYPSUM BOARD ASSEMBLIES

A. Manufacturer List:
   1. CertainTeed.
   2. Georgia-Pacific.
   3. National Gypsum Co.
   4. United States Gypsum Co.
   5. Substitutions: Section 01 60 00 – Product Requirements.

2.2 COMPONENTS

A. Framing Materials:
   1. Studs and Tracks: ASTM C645; GA-216 and GA-600; galvanized sheet steel, 20 gauge minimum, unless indicated otherwise on Drawings; C shape, of depth as shown on Drawings.
   2. Furring, Framing, and Accessories: ASTM C645, GA-216 and GA-600.
   3. Fasteners: ASTM C1002, screws.
   4. Anchorage to Substrate: Tie wire, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

B. Gypsum Board Materials: ASTM C1396.
   1. Fire Rated Gypsum Board: ASTM C36; fire resistive type, UL or WH rated; 5/8 inch thick, maximum available length in place; ends square cut, tapered edges.
      a. Thickness: 5/8 inch.
      b. Width: 4 feet.
      c. Length: 8 feet through 12 feet.
      d. Edges: Tapered.

2.3 ACCESSORIES

A. Gypsum Board Accessories: ASTM C1047; plastic; corner beads, edge trim, and expansion joints.
   1. Plastic Accessories: PVC plastic.

B. Joint Materials: ASTM C475; GA-216; reinforcing tape, joint compound, and water.

C. Gypsum Board Screws: ASTM C1002; length to suit application.
   1. Screws for Steel Framing: Type S.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify site conditions are ready to receive Work and opening dimensions are as indicated on shop drawings and as instructed by manufacturer.

3.2 INSTALLATION

A. Metal Stud Installation:
   1. Install studs in accordance with ASTM C754, ASTM C1007, GA-216 and GA-600.
   2. Metal Stud Spacing: 16 inches on center.
   3. Refer to Drawings for indication of partitions extending stud framing through ceiling to structure above. Maintain clearance under structural building members to avoid deflection transfer to studs. Provide extended leg ceiling runners.
   4. Door Opening Framing: Install double studs at door frame jambs. Install box beam and stud track at frame head height.
   5. Blocking: Nail wood blocking to studs.

B. Acoustic Accessories Installation:
   1. Place acoustic insulation in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions.
   2. Install acoustic sealant within partitions.

C. Gypsum Board Installation:
   1. Install gypsum board in accordance with GA-216 and GA-600.
   2. Erect single layer fire rated gypsum board horizontally, with edges and ends occurring over firm bearing.
   3. Use screws when fastening gypsum board to metal furring or framing.
   4. Place control joints consistent with lines of building spaces, as per manufacturer's recommendations consistent with lines of building spaces and at all openings.
   5. Place corner beads at external corners. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials as indicated on Drawings.

D. Joint Treatment:
   1. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   2. Feather coats on to adjoining surfaces so that camber is maximum 1/32 inch.

E. Provide skim coat of joint compound in accordance with GA-214 to provide a Level 5 finish as specified. Texture skim coat to resemble existing plaster walls to remain.

3.3 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Maximum Variation of Finished Gypsum Board Surface from Flat Surface: 1/8 inch in 10 feet.

3.4 SCHEDULE

A. Finishes in accordance with GA-214 Level:
   1. Level 1: Above finished ceilings concealed from view.
   2. Level 5: Walls exposed to view.

END OF SECTION

SECTION 09 51 13 - ACOUSTICAL PANEL CEILINGS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes suspended metal grid ceiling system, perimeter trim and acoustic panels, and accessories.

B. Related Requirements:
   1. Section 07 90 00 - Joint Protection.

1.2 REFERENCE STANDARDS

A. ASTM International:
   1. ASTM C635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
   2. ASTM C636 - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
   3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
   4. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
   5. ASTM E580 - Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint.
   6. ASTM E1264 - Standard Classification for Acoustical Ceiling Products.

B. Ceilings and Interior Systems Construction Association:
   1. CISCA - Acoustical Ceilings: Use and Practice.

C. Intertek Testing Services (Warnock Hersey Listed):
   1. WH - Certification Listings.

D. National Fire Protection Association:
   1. NFPA 255 – Standard Method of Test of Surface Burning Characteristics of Building materials.
   2. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.

E. Underwriters Laboratories Inc.:
   1. UL - Fire Resistance Directory.
   2. UL 723 - Tests for Surface Burning Characteristics of Building Materials.

1.3 PERFORMANCE REQUIREMENTS

A. Suspension System: Rigidly secure acoustic ceiling system including integral mechanical and electrical components with maximum deflection of 1:240.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit data on metal grid system components and acoustic units.

C. Shop Drawings:
   1. Indicate grid layout and related dimensioning, junctions with other work or ceiling finishes, interrelation of mechanical and electrical items related to system. Indicate method of suspension where interference exists.
      a. Indicate installation details required for seismic design loads.

D. Samples:
   1. Submit two samples 4 x 4 inch in size illustrating material and finish of acoustic units.
   2. Submit two samples each, 12 inches long, of suspension system main runner, cross runner, perimeter molding.

E. Manufacturer's Instructions: Submit special procedures, perimeter conditions requiring special attention.

1.5 QUALITY ASSURANCE

A. Conform to CISCA requirements.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

B. Installer: Company specializing in performing Work of this section with minimum three years experience.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements.

B. Maintain uniform temperature of minimum 55 degrees F, and maximum humidity of 65 to 70 percent prior to, during, and after acoustic unit installation.

1.8 SEQUENCING

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

B. Sequence Work to ensure acoustic ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

C. Install acoustic units after interior wet work is dry.

1.9 EXTRA MATERIALS

A. Section 01 70 00 - Execution and Closeout Requirements: Spare parts and maintenance products.

B. Furnish 5 percent of total acoustic unit area of extra panels to Owner.

PART 2 PRODUCTS

2.1 SUSPENDED ACOUSTICAL CEILINGS

A. Manufacturers:
   1. Armstrong World Industries:
      a. Fine Fissured (1728) panel.
   2. CertainTeed Corporation:
      a. Fine Fissured (HHF-157) panel.
   3. USG Interiors:
      a. Radar ClimaPlus (2210) panel.
   4. Substitutions: Section 01 60 00 - Product Requirements.

2.2 COMPONENTS

A. Acoustic Panels: ASTM E1264, conforming to the following:
   1. Size: 24 x 24 inches.
   2. Thickness: 5/8 inches.
   3. Composition: Mineral.
   4. NRC Range: 0.50 to 0.60.
   5. Edge: Square.
   6. Surface Color: White.
   7. Surface Finish: Non-directional fissured.

B. Grid:
   1. Non-fire Rated Grid: ASTM C635, Heavy Duty; exposed T components die cut and interlocking.
      a. Armstrong: Prelude XL.
      b Celotex: Classic Stab System.
      c. USG: Donn DX .
      d. Substitutions: Section 01 60 00 - Product Requirements.
   2. Grid Materials: Commercial quality cold rolled steel with galvanized coating.
   3. Exposed Grid Surface Width: As per applicable code for seismic design category indicated on Drawings.
   4. Grid Finish: White color.
   5. Accessories: Stabilizer bars, clips, splices, perimeter moldings, and hold down clips, as required for suspended grid system.
   6. Support Channels and Hangers: Galvanized Primed steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

2.3 ACCESSORIES

A. Gasket For Perimeter Moldings: Closed cell rubber sponge tape.

B. Touch-up Paint: Type and color to match acoustic and grid units.

C. Cloud Trim: Color as selected by Architect / Engineer from manufacturer's full range of available colors.
   1. Armstrong: 6 inch Axiom Vector Trim.
   2. CertainTeed Corporation: Approved equal.
   3. USG: Approved equal.
   4. Substitutions: Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify layout of hangers will not interfere with other Work.

3.2 INSTALLATION

A. Lay-In Grid Suspension System:
   1. Install suspension system in accordance with ASTM C636 and as supplemented in this section.
   2. Install suspension system in accordance with ASTM E580.
   3. Install system capable of supporting imposed loads with maximum deflection of 1/240 maximum.
   4. Locate system on room axis according to reflected plan.
   5. Install after major above ceiling work is complete. Coordinate location of hangers with other work.
   6. Install hanger clips during steel deck erection. Install additional hangers and inserts as required.
   7. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
   8. Where ducts or other equipment prevent regular spacing of hangers, reinforce nearest affected hangers and related carrying channels to span extra distance.
   9. Do not support components on main runners or cross runners when weight causes total dead load to exceed deflection capability. Support fixture loads by supplementary hangers located within 6 inches of each corner; or support components independently.
   10. Do not eccentrically load system, or produce rotation of runners.
   11. Perimeter Molding:
      a. Install edge molding at intersection of ceiling and vertical surfaces with gasket.
      b. Use longest practical lengths.
      c. Miter corners.
      d. Install at junctions with other interruptions.

B. Acoustic Units:
   1. Fit acoustic units in place, free from damaged edges or other defects detrimental to appearance and function.
   2. Install units after above ceiling work is complete.
   3. Install acoustic units level, in uniform plane, and free from twist, warp, and dents.
   4. Cutting Acoustic Units:
      a. Cut to fit irregular grid and perimeter edge trim.
      b. Cut square reveal edges to field cut units.
   5. Install hold-down clips to retain panels tight to grid system within 20 feet of exterior door.

3.3 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

C. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION

SECTION 09 65 00 - RESILIENT FLOORING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes resilient tile flooring and resilient base.

1.2 REFERENCES

A. ASTM International:
   1. ASTM D 543 - Standard Practices for Evaluating Resistance to Chemical Reagents.
   2. ASTM D5116 - Standard for Determination of Organic Emissions From Indoor Materials/Products.
   3. ASTM D2047 - Standard Test Method for Static Coefficient of Friction as Measured by the James Machine.
   4. ASTM E662 - Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
   5. ASTM E 1155 - Standard Test Method for Determining FF (Floor Flatness) and FL (Floor Levelness) Numbers.
   6. ASTM F 710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
   7. ASTM F 970 - Standard Test Method for Static Load Limit.
   8. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile.
   9. ASTM F1344 - Standard Specification for Rubber Floor Tile.
   10. ASTM F1700 - Standard Specification for Solid Vinyl Floor Tile.
   11. ASTM F1861 - Standard Specification for Resilient Wall Base.
   12. ASTM F2169 - 12 Standard Specification for Resilient Stair Treads.

B. National Fire Protection Association:
   1. NFPA 253 - Standard Method of Test for Critical Radiant Flux for Floor Covering Systems Using a Radiant Heat Energy Source.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Shop Drawings: Indicate custom patterns and inlay designs.

C. Product Data: Submit data describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

D. Samples:
   1. Submit manufacturer's complete set of color samples for initial selection.
   2. Submit two samples, 2 x 2 inch size illustrating color and pattern for each product specified.

1.4 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.

B. Operation and Maintenance Data: Submit maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years experience.

B. Installer: Company specializing in performing Work of this section with minimum five years experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

B. Protect roll materials from damage by storing on end.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements.

B. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

C. Store materials for not less than 48 hours prior to installation in area of installation at temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

1.8 EXTRA MATERIALS

A. Section 01 70 00 - Execution and Closeout Requirements: Spare parts and maintenance products.

B. Furnish 10 square feet of flooring and 5 lineal feet of base of each type and color specified.

PART 2 PRODUCTS

2.1 VINYL COMPOSITION TILE FLOORING

A. Manufacturers:
1. Forbo; Marmoleum Tile.
2. Substitutions: Not permitted.

B. Vinyl Composition Tile: ASTM F1066:
1. Size: 13.11 by 13.11 inches.
2. Thickness: 0.08 inches.

3. Pattern: Marbleized.
4. Color: 3607 Grey Dusk.

2.2 RESILIENT BASE

A. Manufacturers:
1. Armstrong.
2. Flexco.
3. Johnsonite Inc.
4. Roppe Corp.
5. Inpro.
6. Substitutions: Not Permitted.

B. Base: ASTM F1861Type TS – Vulcanized Rubber; coved style:
1. Height: 4 inch.
2. Thickness: 0.125 inch thick.
3. Finish: Matte.
4. Length: Roll.
5. Accessories: Premolded external corners and end stops.
6. Color: As selected by Architect / Engineer.

2.3 ACCESSORIES

A. Subfloor Filler: Premix latex; type recommended by adhesive material manufacturer.

B. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer for high moisture content concrete slab.

C. Moldings and Edge Strips: Same material as flooring.

D. Feature Strips: Of same material as flooring.

E. Sealer and Wax: Types recommended by flooring manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting Work.

B. Verify concrete floors are dry to maximum moisture content as recommended by manufacturer, and exhibit negative alkalinity, carbonization, and dusting.

C. Verify floor and lower wall surfaces are free of substances capable of impairing adhesion of new adhesive and finish materials.

3.2 PREPARATION

A. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.

B. Prohibit traffic until filler is cured.

C. Clean substrate.

D. Apply primer as required to prevent "bleed-thru" or interference with adhesion by substances cannot be removed.

3.3 INSTALLATION - TILE FLOORING

A. Mix tile from container to ensure shade variations are consistent when tile is placed.

B. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.

C. Install tile to pattern as shown on Drawings. Allow minimum 1/2 full size tile width at room or area perimeter. Multiple colors and random layouts may be required in areas scheduled to receive tile where no pattern is indicated.

D. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

E. Where floor finishes are different on opposite sides of door, terminate flooring under centerline of door.

F. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.

G. Install flooring in recessed floor access covers. Maintain floor pattern.

H. Install feature strips and floor markings where indicated. Fit joints tightly.

3.4 INSTALLATION - BASE

A. Fit joints tightly and make vertical.

B. Miter internal corners. At external corners, use premolded units. Premolded boots or blocks are not acceptable. At exposed ends, use premolded units.

C. Install base on solid backing. Bond tightly to wall and floor surfaces.

D. Scribe and fit to door frames and other interruptions.

3.5 CLEANING

A. Section 01 70 00 - Execution and Closeout Requirements: Final cleaning.

B. Remove excess adhesive from floor, base, and wall surfaces without damage.

C. Clean, seal, and maintain resilient flooring products.

3.6 PROTECTION OF INSTALLED CONSTRUCTION

A. Section 01 70 00 - Execution and Closeout Requirements: Protecting installed construction.

B. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION

SECTION 09 68 13 - TILE CARPETING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes carpet tile, adhered with releasable glue and accessories.

B. Related Requirements:
   1. Section 09 65 00 Resilient Flooring: Base finish and termination edging of adjacent floor finish.

1.2 REFERENCE STANDARDS

A. ASTM International:
   1. ASTM D2859 - Standard Specification for Ignition Characteristics of Finished Textile Floor Covering Materials.

B. Carpet and Rug Institute:
   1. CRI Carpet Installation Standard - Standard for Installation of Commercial Carpet.
   2. CRI Green Label Plus Testing Program.
   3. CRI Model Specifications for Commercial Carpets.

C. Consumer Products Safety Commission:
   1. CPSC 16 CFR 1630 - Standard for the Surface Flammability of Carpets and Rugs.

D. National Fire Protection Association:
   1. NFPA 253 - Standard Method of Test for Critical Radiant Flux for Floor Covering Systems Using a Radiant Heat Energy Source.

1.3 PRE-INSTALLATION MEETINGS

A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.

B. Convene minimum one week prior to commencing Work of this section.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.

C. Shop Drawings: Indicate layout of joints, direction of carpet pile, and location of edge moldings.

D. Samples:
   1. Submit two carpet tiles illustrating color and pattern design for each carpet color selected. Full size carpet tile samples may be required for final color and pattern selection. Submit matching roll carpet samples.
   2. Submit two, 12 inch long samples of edge strip.

E. Manufacturer's Instructions: Submit special procedures and perimeter conditions requiring special attention.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Operation and Maintenance Data: Submit maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for maintenance materials.

B. Extra Stock Materials:
   1. Furnish an additional 2.5 percent of installed carpet tiles of each color and pattern selected.

1.7 QUALITY ASSURANCE

A. Surface Burning Characteristics:
   1. Floor Finishes: Comply with one of the following:
      a. Class I, minimum 0.45 watts/square centimeter when tested in accordance with NFPA 253.
      b. CPSC 16 CFR 1630.

1.8 QUALIFICATIONS

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

B. Installer: Company specializing in performing Work of this section with minimum years documented experience and approved by manufacturer.
   1. FCIB or IFCI certified carpet installers.

1.9 WARRANTY

A. Lifetime Comprehensive Commercial Performance: No failure tuft bind / zippering, edge ravel / fraying, dimensional stability, delamination, structural integrity.

B. Lifetime Comprehensive Commercial Performance Fiber: Soil and stain removal, static dissipation, abrasive wear, colorfastness.

1.10 AMBIENT CONDITIONS

A. Section 01 50 00 - Temporary Facilities and Controls: Ambient conditions control facilities for product storage and installation.

B. Store materials in area of installation for 48 hours prior to installation.

PART 2 PRODUCTS

2.1 CARPET TILE

A. Manufacturer:
   1. Shaw Contract Group:
      a. Light Series tile: Vibrant; Color as selected by Architect / Engineer from manufacturer's full color selection.
         1) Size: 24 by 24 inch tile.
         2) Fiber Product: 100 percent premium branded commercial BCF nylon containing minimum 25 percent post consumer / industrial recycles content and 100 percent sustainable / recyclable.
         3) Dye Method: 100 percent solution.
         4) Primary Backing: Synthetic.
         5) Secondary Backing: Non-PVC thermoplastic composite containing minimum 40 percent post consumer / industrial content and 100 percent sustainable / recyclable.
         6) Gage: 1/12 minimum.
         7) Stitches: 9.5 to 10.0 stitches per inch minimum.
         8) Tufted Yarn Weight: 20 ounce per square yard minimum.
         9) Finish Pile Thickness: 0.103 to 0.116 inches minimum.
         10) Average Density: 6,207 to 6,990 ounces per cubic yard.
         11) Electrostatic Propensity: Less than 3.5 KV.
   2. Other manufacturers will be considered if all performance values are equal to or within 5 percent of those listed above and the same aesthetic of the tile listed above is available. See Section 01 60 00 – Product Requirements for additional information.

2.2 ACCESSORIES

A. Sub-Floor Filler: Type recommended by flooring material manufacturer.

B. Moldings and Edge Strips: Rubber; color as selected by Architect / Engineer.

C. Contact Adhesive: Releasable type compatible with carpet material and high moisture content concrete slabs, and as recommended by carpet manufacturer.

D. Seam Adhesive: Type recommended by flooring material manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify floor surfaces are smooth and flat within tolerances acceptable to flooring manufacturer and are ready to receive Work.

3.2 PREPARATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation preparation.

B. Clean substrate. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.

C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.

3.3 INSTALLATION

A. Install carpet tile in accordance with CRI Carpet Installation Standard.

B. Do not mix carpet from different cartons unless from same dye lot.

C. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.

D. Install carpet tile in pattern as indicated on Drawings, parallel to building lines.

E. Locate change of color or pattern between rooms under door centerline.

F. Fully adhere carpet tile to substrate with pressure sensitive releasable adhesive.

G. Trim carpet tile neatly at walls and around interruptions.

H. Complete installation of edge strips, concealing exposed edges.

3.4 CLEANING

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for cleaning.

B. Remove excess adhesive from floor, base, and wall surfaces without damage.

C. Clean and vacuum carpet surfaces.

END OF SECTION

SECTION 09 77 13 - STRETCHED-FABRIC WALL SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes stretched fabric tackable panels.

B. Related Sections:
   1. Section 09 51 13 - Acoustical Panel Ceilings.
   2. Section 09 65 00 - Resilient Flooring: Rubber base.

1.2 REFERENCES

A. American National Standards Institute:
   1. ANSI A208.1 - Mat-Formed Wood Particleboard.

B. ASTM International:
   1. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
   2. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
   3. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
   4. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

C. APA-The Engineered Wood Association:
   1. APA/EWA PS 1 - Voluntary Product Standard for Construction and Industrial Plywood.

D. American Wood-Preservers' Association:
   1. AWPA C20 - Structural Lumber - Fire-Retardant Treatment by Pressure Processes.
   2. AWPA C27 - Plywood, Fire-Retardant Pressure Treatment.

E. National Fire Protection Association:
   1. NFPA 265 - Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile Coverings on Full Height Panels and Walls, Method B.
   2. NFPA 286 - Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Wall and Ceiling Interior Finish.

F. U. S Department of Commerce National Institute of Standards and Technology:
   1. DOC PS 1 - Construction and Industrial Plywood.
   2. DOC PS 2 - Performance Standard for Wood-Based Structural-Use Panels.
   3. DOC PS 20 - American Softwood Lumber Standard.

1.3 PERFORMANCE REQUIREMENTS

A. Acoustical Absorption: Perform testing in accordance with ASTM C423, Type A mounting method unless otherwise specified.

B. Flame Spread Rating: Provide all components with Class A flame spread rating when tested in accordance with ASTM E 84, unless otherwise specified.

C. Noise Reduction Coefficient (NRC): Minimum 0.55 when tested in accordance with ASTM C423.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Shop Drawings:
   1. Indicate layout and dimensions of acoustical wall panels, frame profiles, core materials, and fabric face.
   2. Indicate interface with adjacent materials.

C. Product Data: Submit data frame, core, fabric, and accessory materials.

D. Samples: Submit two samples of each component illustrating construction, profile and surface texture and finish.
   1. Core Samples: Minimum 2x2 inch in size to illustrate core construction.
   2. Fabric Samples: Minimum 2x2 inch in size to illustrate fabric pattern with full repeat, color, and texture.

E. Manufacturer's Installation Instructions:
   1. Submit manufacturers written installation instructions.
   2. Submit special procedures, and perimeter conditions requiring special attention.

F. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Operation and Maintenance Data: Submit fabric care and maintenance procedures, recommended fabric maintenance materials, and suggested schedule for fabric cleaning.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum 10 years of experience in producing acoustical products of the types specified herein.

B. Installer Qualifications: Acceptable to the manufacturer of the acoustical products being installed.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Accept materials on site in manufacturer's original packaging. Inspect for damage.

C. Store materials indoors with environmental conditions as specified for installation, protect edges from damage.

D. Acclimate materials to installation conditions for seventy two hours prior to installation.

E. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.

B. Do not install acoustical wall treatment until space has been enclosed and is watertight, wet work is complete and dry and adjacent and related work is completed.

C. Do not install acoustical wall until ambient temperature and humidity level will be continuously maintained at conditions indicated for Owner occupancy.

1.9 EXTRA MATERIALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for extra materials.

B. Supply 5 yards of full width fabric for each type, color, and pattern specified.

PART 2 PRODUCTS

2.1 STRETCHED FABRIC ACOUSTIC PANELS

A. Manufacturers:
   1. Homasote Company, Design Wall Interior Panels.
   2. Panel Solutions, Inc., Tackable Surfaces.
   3. Golterman and Sabo, Acoustic-Track ATM Acoustical Wall Panels.
   4. Substitutions: Section 01 60 00 - Product Requirements.

B. Product Description: Stretched fabric acoustical panels, tackable core and fabric face.
   1. Provide all acoustical products specified in this section by a single manufacturer.

2.2 CORE MATERIALS

A. Tackable Core:
   1. Mineral Fiberboard: 34 pounds per cubic foot density, perforated face, 5/8 inches thick.

2.3 FABRIC

A. Fabric:
   1. Content: 100 percent polyester.
   2. Weight: 16 pounds per linear yard.
   3. Tensile Strength: 150 pounds minimum.
   4. Tear Strength: 30 pounds minimum.
   5. ASTM E84: Class A.
   6. MFPA Test No. 214: Passes.
   7. Adhered to face of substrate.
   8. Color: As selected by Architect / Engineer from manufacturer's full range of color selections.

2.4 ACCESSORIES

A. Fasteners: Type recommended by panel manufacturer to suit application.

B. Adhesive: Type recommended by panel manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify substrate is flat, plumb and level and ready to receive the Work of this section.

C. Verify adjacent and related Work is complete.

D. Verify blocking to receive frame attachment is installed and properly located.

3.2 PREPARATION

A. Follow manufacturer's instructions by separating and allowing panels to be exposed to environmental temperature and humidity conditions for not less than 24 hours before start of installation.

B. Clean surfaces thoroughly prior to installation.

3.3 INSTALLATION

A. Install plumb, level, in plane, and aligned from wall to wall and floor to ceiling where indicated on Drawings.

B. Secure to substrate with adhesive and fasteners in accordance with manufacturer's instructions.

C. Install panels a minimum of 6 inches above ceiling plane.

D. Install panels within 3 1/2 inches of finish floor. Install 1/2 inch thick wood blocking between panels and finish floor. Adhere base material directly to wood blocking.

E. Omit panels and install wood panel blocking of thickness to match panels where required for mounting fire alarm devices, television monitors, etc.

3.4 ERECTION TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Maximum Variation From Indicated Position: 1/4 inch.

C. Maximum Offset From Indicated Alignment: 1/16 inch.

D. Maximum Out of Square: 1/4 inch difference in panel diagonals.

3.5 CLEANING

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for cleaning.

B. Clean exposed fabric faces as per manufacturer's instructions.

C. Replace damaged panels.

END OF SECTION

SECTION 09 90 00 - PAINTING AND COATING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes surface preparation and field application of paints and other coatings.

1.2 REFERENCES

A. ASTM International:
1. ASTM D16 - Standard Terminology Relating to Paint, Varnish, Lacquer, and Related Products.
2. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials.
3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

B. Green Seal:
1. GC-03 - Anti-Corrosive Paints.
2. GS-11 - Product Specific Environmental Requirements.

C. National Fire Protection Association:
1. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.

D. Painting and Decorating Contractors of America:
1. PDCA - Architectural Painting Specification Manual.

E. South Coast Air Quality Management District:
1. SCAQMD Rule 1113 - Architectural Coatings.

F. SSPC: The Society for Protective Coatings:
1. SSPC - Steel Structures Painting Manual.

G. Underwriters Laboratories Inc.:
1. UL 723 - Tests for Surface Burning Characteristics of Building Materials.

1.3 DEFINITIONS

A. Conform to ASTM D16 for interpretation of terms used in this section.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit data on finishing products and special coatings.

C. Samples:
   1. Submit two paper chip samples illustrating full range of colors available for each surface finishing product scheduled.

D. Manufacturer's Installation Instructions: Submit special surface preparation procedures, and substrate conditions requiring special attention.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.

B. Operation and Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

1.6 QUALIFICATIONS

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

B. Applicator: Company specializing in performing Work of this section with minimum three years documented experience and approved by manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

B. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

C. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

D. Paint Materials: Store at minimum ambient temperature of 45 degrees F and maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements.

B. Do not apply materials when surface and ambient temperatures are outside temperature ranges required by paint product manufacturer.

C. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.

D. Provide lighting level of 80 foot candle measured mid-height at substrate surface.

1.9 SEQUENCING

A. Section 01 10 00 - Summary: Work sequence.

B. Verify existing conditions and requirements of other trades before starting Work.

C. Sequence application to the following:
1. Do not apply finish coats until paintable sealant is applied.
2. Back prime wood trim before installation of trim.

1.10 EXTRA MATERIALS

A. Section 01 70 00 - Execution and Closeout Requirements: Spare parts and maintenance products.

B. Supply 1 gallon of each color, type, and surface texture; store where directed by Owner.

C. Label container with color, type, and room locations, in addition to manufacturer's label.

PART 2 PRODUCTS

2.1 PAINTS AND COATINGS

A. Manufacturers:
1. The Glidden Co.
2. Benjamin Moore.
3. Sherwin-Williams.
4. Pittsburg Paints.
5. Substitutions: Not permitted.

2.2 COMPONENTS

A. Coatings: Ready mixed, except field catalyzed coatings. Prepare coatings:
1. To soft paste consistency, capable of being readily and uniformly dispersed to homogeneous coating.
2. For good flow and brushing properties.
3. Capable of drying or curing free of streaks or sags.

B. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve finishes specified; commercial quality.

C. Patching Materials: Latex filler.

D. Fastener Head Cover Materials: Latex filler.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions and requirements of other trades before starting Work.

B. Verify surfaces and substrate conditions are ready to receive Work as instructed by product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of Work. Report conditions capable of affecting proper application.

D. Test shop applied primer for compatibility with subsequent cover materials.

E. Do not apply paint pavement markings to concrete surfaces until concrete has cured for 28 days.

F. Measure moisture content of surfaces using electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Plaster and Gypsum Wallboard: 12 percent.
   2. Masonry, Concrete and Concrete Unit Masonry: 12 percent.

3.2 PREPARATION

A. Surface Appurtenances: Remove electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.

B. Surfaces: Correct defects and clean surfaces capable of affecting Work of this section. Remove or repair existing coatings exhibiting surface defects.

C. Marks: Seal with shellac those which may bleed through surface finishes.

D. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

E. Gypsum Board Surfaces: Fill minor defects with filler compound. Spot prime defects after repair.

F. Galvanized Surfaces: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

G. Plaster Surfaces: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.

H. Concrete and Unit Masonry Surfaces Scheduled to Receive Paint Finish: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.

I. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.

J. Uncoated Steel and Iron Surfaces: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Spot prime paint after repairs.

K. Concrete Floors: Remove contamination, acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.

L. Interior Wood Items Scheduled to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats.

M. Metal Doors Scheduled for Painting: Prime metal door top and bottom edge surfaces.

3.3 APPLICATION

A. Multiple colors shall be selected and accent walls shall be a component of the Project.

B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

C. Apply each coat to uniform appearance. Apply each coat of paint slightly darker than preceding coat unless specified otherwise.

D. Sand wood and metal surfaces lightly between coats to achieve required finish.

E. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

F. Where clear finishes are required, tint fillers to match wood. Work fillers into grain before set. Wipe excess from surface.

G. Prime concealed surfaces of interior wood surfaces scheduled to receive stain or varnish finish with gloss varnish reduced 25 percent with thinner.

H. Finishing Mechanical And Electrical Equipment:
1. Refer to Division 22, Division 23, Division 26, and Division 27 for schedule of color-coding and identification banding of equipment, ductwork, piping, and conduit.
2. Paint shop primed equipment.
3. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
4. Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, except where items are shop finished.

5. Paint interior surfaces of air ducts visible through grilles and louvers with one coat of flat black paint to visible surfaces. Paint dampers exposed behind louvers, and grilles to match face panels.
6. Paint exposed conduit and electrical equipment occurring in finished areas.
7. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.
8. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.4 FIELD QUALITY CONTROL

A. Section 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Inspect and test questionable coated areas.

3.5 CLEANING

A. Section 01 70 00 - Execution and Closeout Requirements: Final cleaning.

B. Collect waste material which may constitute fire hazard, place in closed metal containers, and remove daily from site.

3.6 PROTECTION OF INSTALLED CONSTRUCTION

A. Protect Work of other trades and surfaces not being painted.

B. Automatic fire sprinklers must not be painted and must be protected from paint over spray. Any sprinklers inadvertently painted must be replaced rather than cleaned.

C. Protect completed Work from damage by other trades.

3.7 SCHEDULE - SHOP PRIMED ITEMS FOR SITE FINISHING

A. Standard Steel Frames (Section 08 12 14): Exposed surfaces.

B. Standard Steel Doors (Section 08 13 14): Exposed surfaces.

3.8 SCHEDULE - INTERIOR SURFACES

A. Steel:
1. One coat SW Pro Industrial Pro-Cryl Primer; B66-310 or approved equal.
   a. Two to four mils dry.
2. Two coats SW ProMar 200 Alkyd Semi-Gloss; B34W200 or approved equal.
   a. Four mils wet, 1.7 mils dry.

B. Steel - Galvanized:
1. One coat SW Pro Industrial Pro-Cryl Primer; B66-310 or approved equal.
   a. Two to four mils dry.
2. Two coats SW ProMar 200 Alkyd Semi-Gloss; B34W200 or approved equal.
   a. Four mils wet, 1.7 mils dry per coat.

D. Interior Ferrous Metal (Exposed Structure / Decking) Finish Dry Fall-Out:
   1. One coat SW Save-Lite Dry Fall; B47W62 or approved equal.
      a. Three point two mils wet.

E. Gypsum Board Walls:
   1. One coat SW PrepRite 200 Latex Primer; B28W200 or approved equal.
      a. Four mils wet, 1.2 mils dry.
   2. Two coats SW ProMar 200 Latex Semi-Gloss; B300W200 or approved equal.
      a. Four mils wet, 1.4 mils dry per coat.

F. Concrete:
   1. One coat SW Heavy Duty Block Filler; B42W46 or approved equal.
      a. 75 to 125 square feet per gallon.
   2. Two coats SW Water Based Catalyzed Epoxy; B70 or approved equal.
      a. Four mils wet, 1.4 mils dry per coat.

G. Concrete Block:
   1. One coat SW Heavy Duty Block Filler; B42W46 or approved equal.
      a. 75 to 125 square feet per gallon.
   2. Two coats SW Water Based Catalyzed Epoxy; B70 or approved equal.
      a. Four mils wet, 1.4 mils dry per coat.

3.8 SCHEDULE – EXTERIOR SURFACES

A. Steel:
   1. One coat SW Pro Industrial Pro-Cryl Universal Primer, B66-310 Series or approved equal.
      a. Ten mils wet, 4 mils dry.
   2. Two coats SW Metalatex Acrylic Semi-Gloss, B42 Series or approved equal.
      a. Four mils wet, 1.5 mils dry per coat.

B. Steel Galvanized:
   1. Two coats SW Metalatex Semi-Gloss, B42 Series or approved equal.
      a. Four mils wet, 1.5 mils dry per coat.

END OF SECTION

SECTION 12 30 40 - GENERAL CASEWORK

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:
   1. Prefabricated plastic laminate casework, flush overlay design, as shown on Drawings, schedules and equipment lists.
   2. Fillers, scribes, finished ends, finished backs, work surfaces/back splashes, and cutouts required providing a complete and finished project. Plastic laminate work surfaces shall include backer sheet.
   3. Locks where shown on casework drawings or described in equipment lists.

B. Related Sections:
   1. Section 06 10 53 - Miscellaneous Rough Carpentry.
   2. Section 09 65 00 - Resilient Flooring, Rubber Base.

1.2 REFERENCES

A. American National Standards Institute.
   1. ANSI A156.9 - Cabinets Hardware.
   2. ANSI A208.1 - Mat formed Particleboard.

B. Architectural Woodwork Institute.
   1. AWI - Quality Standards Illustrated.

C. National Electrical Manufacturers Association.
   1. NEMA LD3- High Pressure Decorative Laminates.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal Procedures.

B. Shop drawings shall be submitted for approval within thirty days after formal notification of award of contract. Drawings shall consist of floor plans indicating arrangement and relation to adjacent work and equipment, and complete elevations of casework. Centerline of service requirements shall be noted for use by other trades. A schedule of all sinks, fittings, and accessories that are part of this contract shall be provided.

C. Color samples shall be submitted for selection by Architect/Engineer. Samples of actual material and color shall be available as required.

D. Additional catalog cuts, details and samples of hardware as requested by Architect / Engineer for evaluation and coordination.

1.4 QUALITY ASSURANCE;

A. Manufacturer: Company specializing in manufacture of institutional and commercial plastic laminate casework with minimum of five years experience.

B. Installer Qualifications: Installer with 5 years experience who has successfully completed installations of plastic laminate faced casework similar in material, design, and extent to that indicated for this project.

C. Perform work in accordance with AWI Architectural Woodwork Quality Standards Illustrated, Custom Grade.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

B. Protect units from moisture damage.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements.

B. During and after installation of Work of this section, maintain same temperature and humidity conditions in building spaces as will occur after occupancy.

1.7 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.8 WARRANTY

A. Casework manufacturer shall warrant for a period of three years, the product manufactured by it to be free from defects in material and workmanship when properly installed under normal use, but not limited to delamination, swelling or warping.

PART 2 PRODUCTS

2.1 GENERAL CASEWORK

A. Manufacturers:
1. Case Systems, Inc.
2. LSI Corporation of America, Inc.
3. Precision Millwork Company.
4. Reynolds & Doyle, Inc.
5. Stevens Cabinet Co., Division of Stevens Industries.
6. TMI Systems Design Corporation.
7. Wilson Kitchens, Inc.
8. Substitutions: Not permitted.

2.2 SURFACE MATERIALS

A. Cabinet

1. Exposed finish ends, fronts, modesty panels, and finish backs shall be faced with vertical grade PF-28 high pressure decorative laminate (HPL), tested under National Electrical Manufacturers Association (NEMA) LD3-2005. Decorative laminate shall be thermoset to core using catalyzed polyvinyl acetate (PVA) glue with minimum 80 pounds per square inch pressure and average 180 degrees F temperature.
   a. Interior surfaces on open cabinets shall be faced with vertical grade PF-28 high pressure decorative laminate (HPL), tested under National Electrical Manufacturers Association (NEMA) LDF-2005.
2. Panels with exterior PF-28 surfaces shall have 0.020 inch cabinet liner surface interior.

2.3 CORE MATERIALS

A. Particleboard: Shall be high performance industrial grade core. Particleboard shall be 45 to 48 pound density 3-ply type formation conforming to ANSI A208.1 and ASTM D1037-91A standards.

B. Medium Density Fiberboard: Core shall be minimum 48 pound density conforming to ANSI A208.1 MD-130 standards.

2.4 EDGINGS

A. Door and Drawer Fronts: Edges shall have 0.020 inch flat edge extrusion banding to match face pattern and colors. Automated hot melt adhesive application and trimming.

B. Cabinet Edges: Cabinet sides, top, bottom, adjustable shelves and other interior components shall be edged with 0.020 inch flat edge extrusion. Automated hot melt adhesive application and trimming.

C. Drawer Components: 3/4 inch and 1 inch sides shall be edged with 0.020 inch flat edge extrusion. Automated hot melt adhesive application and trimming.

2.5 HARDWARE

A. Concealed Hinges: Shall be commercial grade 120 degree pivot overlay style. Hinges shall be two piece construction with door hinge and cabinet mounting plate. Hinges shall be compact design with minimally intrusive mechanism into compartment space. Hinges shall have spring loaded self-close feature. Hinges shall be provided two per door up to 47 inches in height, 3 per door up to 63 inches in height and 4 per door above 63 inches in height. Concealed hinges shall have 3 way (vertical, in-out, horizontal) alignment adjustments. Hinges shall be mounted with 5mm thread fasteners and nylon screw mount inserts.

B. Door catches shall be a heavy-duty spring loaded, large diameter (17.5 mm) roller type catch mounted at door bottom. All doors over 48 inches in height shall be provided with roller catch at both top and bottom of door. Catch strike plate shall be injection molded with integral molded engagement ridge and wide face bumper door stop.

C. Pulls shall be solid metal bent wire, 4 inches length, available in chrome or brass finish.

D. Drawer and Slide Out Shelves Slides: Extension slides shall be bottom and side mount epoxy steel slides. Lateral stability achieved through a formed captive slide profile. Slides shall glide on nylon rollers and carry a 100 pound dynamic load rating. Slides feature both in and out drawer stop with 3 inch self close and adjustable cam side alignment. Slides shall also be tested under the Scientific Equipment and Furniture Association (SEFA) 6.5 Drawer Cycle Test.

E. Full Extension Slides: Slides shall be side mounted with profile to not reduce interior drawer space normally provided. Ball bearing slides to be tested under The Business and Institutional Furniture Manufacturer's Association (BIFMA) X5.5 Section 7. Slides shall pas both 50,000 and 100,000 cycle test with a 120 pound load rating.

F. Hanger Bars: Shall be heavy chrome plated oval tubing mounted in adjustable end wall sockets.

G. Self-support clips for 1 inch thick adjustable shelves shall be injection molded clear polycarbonate. Support clips shall incorporate integral molded lock tabs to retain shelf from tipping or inadvertently being lifted out. Support clip shall have 5 mm diameter double pin engagement into precision bored hole pattern in cabinet vertical members. Adjustment shall be 1 ¼ inch spacing. Clips shall have a molded ridge, which provides pressure against edge of shelving to maintain positive pin engagement. Clip shall be designed in such a manner to provide means for permanent retention to shelf. Static test load must exceed 200 pounds per clip. Shelf spans above 27 inches shall have 5-point support with backs drilled to receive a mid span shelf support.

H. Locks: Shall be high security 6-tumbler lock system. Locks shall have diecaset body with dead bolt engagement tang. Locks shall have removable and interchangeable core for easy field and customer re-keying. Locks shall be master keyed and available key-alike or key-different with 250 standard key changes and the possibility of up to 2000 total changes.

2.6 COMPONENTS

A. Fronts: Door and drawer fronts shall be 3/4 inch thick. Fronts shall be edged with 0.020 inch flat edge extrusion with face laminate. Automated hot melt adhesive application and trimming.

B. Wall cabinet components shall be 3/4 inch thick members throughout. Wall cabinet tops and bottoms include back groove and minimum four dowel pins per joint for insertion into cabinet ends. Wall cabinet ends shall be 3/4 inch thick with back groove and precision Computer Numerical Control (CNC) drill pattern for accurate location of fixed members, hardware, and shelf supports. Wall cabinets shall have two integral dowel into end mounting frames.

C. Mounting frames incorporated in wall units, tall units, and base units, shall be ¾ inch thick with minimum two dowel pins per mounting frame end joint for wall and tall units. Base units shall have a minimum of three dowel pins per mounting frame end joint.

D. Tall cabinet components shall be 3/4 inch thick members throughout. Tall cabinet tops and bottoms shall include back groove and up to eight total dowels per end joint. Tall cabinet ends shall be 3/4 inch thick with back groove and precision Computer Numerical Control (CNC) drill pattern for accurate location of fixed members, hardware, and shelf supports. Tall cabinets shall have two integral dowel into end mounting frames.

E. Base cabinet components shall be 3/4 inch throughout. Base unit bottoms shall incorporate back groove and up to eight dowel pins per end joints. Base units shall have a wide top and back frame feature. Construction shall provide lateral and vertical stability. Base cabinet ends shall be 3/4 inch thick with back groove and precision Computer Numerical Control (CNC) drill pattern for accurate location of fixed members, hardware, and shelf supports.

F. Toe Kicks: Bases shall be an integral base design. Construction of end panels, cabinet bottoms and horizontal toe kick members shall be integrally joined. Separate detached bases shall not be acceptable.

G. Backs: Shall be in an integrated system of 1/4 inch prefinished medium density fiberboard back captured in side and horizontal grooves. Unit back to be further integrated with attachment to ¾ inch doweled-in mounting frames. Fixed backs shall be mechanically fastened into groove and sealed with hot melt adhesive. Removable backs shall be set in groove and attached with screws.

H. Adjustable Shelves: All adjustable shelves shall be 1 inch thick. Shelving shall have end 4 point support for spans under 27 inches and 5 point support with backs drilled to receive additional mid-span shelf support for spans over 27 inches.

I. Drawers: Four sided full box design with separate attached front shall be provided. Drawer members shall be 3/4 inch thick dowel pin construction at all four corners. Drawer bottoms shall be 1/4 inch medium density fiberboard trapped in groove four edges as well as mechanically fastened.

J. File Drawers: Shall have formed cold roll 16 gauge metal sides. Sides shall be powder coated and include formed in file hanger rails. File drawers shall be suspended on full extension ball bearing side mounting slides. Full extension ball bearing suspensions shall be BIFMA 120 pound load rated slides.

2.7 LAMINATE TOPS

A. Countertops shall be high pressure decorative laminate, thermoset to core using catalyzed PVA glue with minimum average pressure of 80 pounds per square inch and average 180 degree F temperature. Decorative laminate shall meet NEMA LD3-2005 PF-42 specification standards.

B. Laminate tops shall be solid particleboard core structures and laminated with backer sheet.

PART 3 EXECUTION

3.1 INSTALLATION

A. The installer must examine the job site and the conditions under which the Work in this section is to be performed, and notify the contractor in writing of any unsatisfactory conditions. Do not proceed with Work under this section until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

B. Casework, countertops, and related materials to be conditioned to average prevailing humidity condition in installation areas prior to start of Work.

C. Install casework and countertops with factory-trained supervision authorized by manufacturer. Casework shall be installed plumb, level, true and straight with no distortions. (Shim as required). Securely attached to building structure with anchorage devices of appropriate type, size and quantity to meet applicable codes, specifications, and safety conditions. Where laminate clad casework and countertop abuts other finished Work, scribe and trim to accurate fit.

D. Adjust casework and hardware so that doors and drawers operate smoothly without warp or bind. Lubricate operating hardware as recommended by the manufacturer.

E. Repair, or remove and replace, defective work as directed upon completion of installation.

F. Clean plastic surfaces, repair minor damage per plastic laminate manufacturer's recommendations. Replace other damaged parts of units.

G. Advise contractor of procedures and precautions for protection of casework and countertops from damage by other trades until acceptance of Work by Owner.

H. Cover casework with 4-mil polyethylene film for protection against soiling and deterioration during remainder of construction period.

END OF SECTION

SECTION 23 07 19 - HVAC PIPING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes insulation for HVAC piping systems.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory and field applied if any).

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.

C. Field quality-control reports.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.

B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products in accordance with ASTM E84, by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
   1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
   2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.6 COORDINATION

A. Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

B. Coordinate installation and testing of heat tracing.

1.7 SCHEDULING

A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.

B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. Comply with requirements in "Piping Insulation Schedule, General," "Indoor Piping Insulation Schedule," "Outdoor, Aboveground Piping Insulation Schedule," and "Outdoor, Underground Piping Insulation Schedule" articles for where insulating materials shall be applied.

B. Products shall not contain asbestos, lead, mercury, or mercury compounds.

C. Products that come into contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested in accordance with ASTM C871.

D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable in accordance with ASTM C795.

E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.

F. Calcium Silicate: Preformed Pipe Sections: Flat-, curved-, and grooved-block sections of noncombustible, inorganic, hydrous calcium silicate with a non-asbestos fibrous reinforcement. Comply with ASTM C533, Type I.
   1. Prefabricated Fitting Covers: Comply with ASTM C450 and ASTM C585 for dimensions used in preforming insulation to cover valves, elbows, tees, and flanges.

G. Cellular Glass: Inorganic, incombustible, foamed or cellulated glass with annealed, rigid, hermetically sealed cells. Comply with ASTM C552.
   1. Preformed Pipe Insulation: Type II, Class 1, without jacket.
   2. Preformed Pipe Insulation: Type II, Class 2, with factory-applied ASJ jacket.
   3. Factory fabricate shapes in accordance with ASTM C450 and ASTM C585.
   4. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

H. Flexible Elastomeric: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C534/C534M, Type I for tubular materials, Type II for sheet materials.

2.2 INSULATING CEMENTS

A. Mineral-Fiber Insulating Cement: Comply with ASTM C195.

B. Mineral-Fiber, Hydraulic-Setting Insulating and Finishing Cement: Comply with ASTM C449.

2.3 ADHESIVES

A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.

B. Calcium Silicate Adhesive: Fibrous, sodium-silicate-based adhesive with a service temperature range of 50 to 800 deg F (10 to 427 deg C).

C. Cellular-Glass Adhesive: Two-component, thermosetting urethane adhesive containing no flammable solvents, with a service temperature range of minus 100 to plus 200 deg F (minus 73 to plus 93 deg C).

D. Flexible Elastomeric and Polyolefin Adhesive: Solvent-based adhesive.
   1. Flame-spread index shall be 25 or less and smoke-developed index shall be 50 or less as tested in accordance with ASTM E84.
   2. Wet Flash Point: Below 0 deg F (minus 18 deg C).
   3. Service Temperature Range: 40 to 200 deg F (4 to plus 93 deg C).
   4. Color: Black

E. ASJ Adhesive and FSK and PVDC Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A, for bonding insulation jacket lap seams and joints.

F. PVC Jacket Adhesive: Compatible with PVC jacket.

2.4 MASTICS AND COATINGS

A. Materials shall be compatible with insulation materials, jackets, and substrates.

B. Vapor-Retarder Mastic, Water Based: Suitable for indoor use on below-ambient services.
   1. Water-Vapor Permeance: Comply with ASTM E96/E96M or ASTM F1249.
   2. Service Temperature Range: 0 to plus 180 deg F (Minus 18 to plus 82 deg C)

3. Comply with MIL-PRF-19565C, Type II, for permeance requirements
4. Color: White

C. Vapor-Retarder Mastic, Solvent Based, Indoor Use: Suitable for indoor use on below-ambient services.
1. Water-Vapor Permeance: Comply with ASTM E96/E96M or ASTM F1249.
2. Service Temperature Range: 0 to 180 deg F (Minus 18 to plus 82 deg C).
3. Color: White

D. Vapor-Retarder Mastic, Solvent Based, Outdoor Use: Suitable for outdoor use on below-ambient services.
1. Water-Vapor Permeance: Comply with ASTM E96/E96M or ASTM F1249.
2. Service Temperature Range: Minus 50 to plus 220 deg F (Minus 46 to plus 104 deg C).
3. Color: White

E. Breather Mastic: Water based; suitable for indoor and outdoor use on above-ambient services.
1. Water-Vapor Permeance: ASTM E96/E96M, greater than 1.0 perm (0.66 metric perms) at manufacturer's recommended dry film thickness.
2. Service Temperature Range: 0 to plus 180 deg F (Minus 18 to plus 82 deg C)
3. Color: White

2.5 LAGGING ADHESIVES

A. Adhesives shall comply with MIL-A-3316C, Class I, Grade A, and shall be compatible with insulation materials, jackets, and substrates.
1. Fire-resistant, water-based lagging adhesive and coating for use indoors to adhere fire-resistant lagging cloths over pipe insulation.
2. Service Temperature Range: 0 to plus 180 deg F (Minus 18 to plus 82 deg C).
3. Color: White.

2.6 SEALANTS

A. Materials shall be as recommended by the insulation manufacturer and shall be compatible with insulation materials, jackets, and substrates.

B. Joint Sealants:
1. Permanently flexible, elastomeric sealant.
   a. Service Temperature Range: Minus 150 to plus 250 deg F (Minus 101 to plus 121 deg C)
   b. Color: White or gray.

C. FSK and Metal Jacket Flashing Sealants:
1. Fire- and water-resistant, flexible, elastomeric sealant.
2. Service Temperature Range: Minus 40 to plus 250 deg F (Minus 40 to plus 121 deg C).
3. Color: Aluminum.

D. ASJ Flashing Sealants and PVDC and PVC Jacket Flashing Sealants:
   1. Fire- and water-resistant, flexible, elastomeric sealant.
   2. Service Temperature Range: Minus 40 to plus 250 deg F (Minus 40 to plus 121 deg C).
   3. Color: White.

2.7 FACTORY-APPLIED JACKETS

A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
   1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C1136, Type I.
   2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C1136, Type I.
   3. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C1136, Type II.

2.8 FIELD-APPLIED JACKETS

A. Field-applied jackets shall comply with ASTM C1136, Type I, unless otherwise indicated.

B. FSK Jacket: Aluminum-foil-face, fiberglass-reinforced scrim with kraft-paper backing.

C. PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D1784, Class 16354-C; thickness as scheduled; roll stock ready for shop or field cutting and forming. Thickness is indicated in field-applied jacket schedules.
   1. Adhesive: As recommended by jacket material manufacturer.
   2. Color: Color-code jackets based on system
   3. Factory-fabricated fitting covers to match jacket if available; otherwise, field fabricate.
      a. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, unions, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories.

D. Metal Jacket:
   1. Stainless-Steel Jacket: ASTM A240/A240M.
      a. Factory cut and rolled to size.
      b. Material, finish, and thickness are indicated in field-applied jacket schedules.
      c. Moisture Barrier for Indoor Applications: 3-mil- (0.075-mm-) thick, heat-bonded polyethylene and kraft paper
      d. Moisture Barrier for Outdoor Applications: 3-mil- (0.075-mm-) thick, heat-bonded polyethylene and kraft paper
      e. Factory-Fabricated Fitting Covers:

         1) Same material, finish, and thickness as jacket.
         2) Preformed two-piece or gore, 45- and 90-degree, short- and long-radius elbows.
         3) Tee covers.
         4) Flange and union covers.
         5) End caps.

6) Beveled collars.
7) Valve covers.
8) Field fabricate fitting covers only if factory-fabricated fitting covers are not available.

2.9 TAPES

A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C1136.
   1. Width: 3 inches (75 mm)
   2. Thickness: 11.5 mils (0.29 mm)
   3. Adhesion: 90 ounces force/inch (1.0 N/mm) in width.
   4. Elongation: 2 percent.
   5. Tensile Strength: 40 lbf/inch (7.2 N/mm) in width.
   6. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

B. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C1136.
   1. Width: 3 inches (75 mm)
   2. Thickness: 6.5 mils (0.16 mm)
   3. Adhesion: 90 ounces force/inch (1.0 N/mm) in width.
   4. Elongation: 2 percent.
   5. Tensile Strength: 40 lbf/inch (7.2 N/mm) in width.
   6. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.

C. PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive; suitable for indoor and outdoor applications.
   1. Width: 2 inches (50 mm)
   2. Thickness: 6 mils (0.15 mm)
   3. Adhesion: 64 ounces force/inch (0.7 N/mm) in width.
   4. Elongation: 500 percent.
   5. Tensile Strength: 18 lbf/inch (3.3 N/mm) in width.

D. PVDC Tape for Indoor Applications: White vapor-retarder PVDC tape with acrylic adhesive.
   1. Width: 3 inches (75 mm)
   2. Film Thickness: 2 mils (0.05 mm)
   3. Adhesive Thickness: 1.5 mils (0.04 mm)
   4. Elongation at Break: 120 percent.
   5. Tensile Strength: 20 psi (138 kPa) in width.

E. PVDC Tape for Outdoor Applications: White vapor-retarder PVDC tape with acrylic adhesive.
   1. Width: 3 inches (75 mm)
   2. Film Thickness: 6 mils (0.15 mm)
   3. Adhesive Thickness: 1.5 mils (0.04 mm)
   4. Elongation at Break: 145 percent.
   5. Tensile Strength: 55 psi (379 kPa) in width.

2.10 SECUREMENTS

A. Bands:
   1. Stainless Steel: ASTM A240/A240M, Type 304 or Type 316; 0.015 inch (0.38 mm) thick, 3/4 inch (19 mm) wide with wing seal or closed seal.
   2. Aluminum: ASTM B209 (ASTM B209M), Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch (0.51 mm) thick, 3/4 inch (19 mm) wide with wing seal or closed seal.
   3. Springs: Twin spring set constructed of stainless steel, with ends flat and slotted to accept metal bands. Spring size is determined by manufacturer for application.

B. Staples: Outward-clinching insulation staples, nominal 3/4 inch (19 mm) wide, stainless steel or Monel.

C. Wire: 0.080-inch (2.0-mm) nickel-copper alloy or 0.062-inch (1.6-mm) soft-annealed, stainless steel

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
   1. Verify that systems to be insulated have been tested and are free of defects.
   2. Verify that surfaces to be insulated are clean and dry.

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

3.2 PREPARATION

A. Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

B. Clean and prepare surfaces to be insulated. Before insulating, apply a corrosion coating to insulated surfaces as follows:
   1. Stainless Steel: Coat 300 series stainless steel with an epoxy primer 5 mils (0.127 mm) thick and an epoxy finish 5 mils (0.127 mm) thick if operating in a temperature range between 140 and 300 deg F (60 and 149 deg C). Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.
   2. Carbon Steel: Coat carbon steel operating at a service temperature of between 32 and 300 deg F (0 and 149 deg C) with an epoxy coating. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.

C. Coordinate insulation installation with the tradesman installing heat tracing. Comply with requirements for heat tracing that apply to insulation.

D. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless steel surfaces, use demineralized water.

3.3 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping, including fittings, valves, and specialties.

B. Install insulation materials, forms, vapor barriers or retarders, jackets, and of thicknesses required for each item of pipe system, as specified in insulation system schedules.

C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Install multiple layers of insulation with longitudinal and end seams staggered.

F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

G. Keep insulation materials dry during storage, application, and finishing. Replace insulation materials that get wet.

H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

I. Install insulation with least number of joints practical.

J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
   1. Install insulation continuously through hangers and around anchor attachments.
   2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends attached to structure with vapor-barrier mastic.
   3. Install insert materials and insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
   4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.

K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

L. Install insulation with factory-applied jackets as follows:
   1. Draw jacket tight and smooth.
   2. Cover circumferential joints with 3-inch- (75-mm-) wide strips, of same material as insulation jacket. Secure strips with adhesive and outward-clinching staples along both edges of strip, spaced 4 inches (100 mm) o.c.
   3. Overlap jacket longitudinal seams at least 1-1/2 inches (38 mm). Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward-clinching staples along edge at 4 inches (100 mm) on center.
      a. For below-ambient services, apply vapor-barrier mastic over staples.

4. Cover joints and seams with tape, in accordance with insulation material manufacturer's written instructions, to maintain vapor seal.
5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.

M. Cut insulation in a manner to avoid compressing insulation more than 25 percent of its nominal thickness.

N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches (100 mm) beyond damaged areas. Adhere, staple, and seal patches in similar fashion to butt joints.

P. For above-ambient services, do not install insulation to the following:
1. Vibration-control devices.
2. Testing agency labels and stamps.
3. Nameplates and data plates.

3.4 PENETRATIONS

A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches (50 mm) below top of roof flashing.
4. Seal jacket to roof flashing with flashing sealant.

B. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.

C. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches (50 mm).
4. Seal jacket to wall flashing with flashing sealant.

D. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

E. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.
   1. Comply with requirements in Section 078400 "Firestopping" for firestopping and fire-resistive joint sealers.

F. Insulation Installation at Floor Penetrations:
   1. Pipe: Install insulation continuously through floor penetrations.
   2. Seal penetrations through fire-rated assemblies. Comply with requirements in Section 078400 "Firestopping."

3.5 GENERAL PIPE INSULATION INSTALLATION

A. Requirements in this article generally apply to all insulation materials, except where more specific requirements are specified in various pipe insulation material installation articles.

B. Insulation Installation on Fittings, Valves, Strainers, Flanges, Mechanical Couplings, and Unions:
   1. Install insulation over fittings, valves, strainers, flanges, mechanical couplings, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
   2. Insulate pipe elbows using preformed fitting insulation made from same material and density as that of adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
   3. Insulate tee fittings with preformed fitting insulation of same material and thickness as that used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
   4. Insulate valves using preformed fitting insulation of same material, density, and thickness as that used for adjacent pipe. Overlap adjoining pipe insulation by not less than 2 times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
   5. Insulate strainers using preformed fitting insulation of same material, density, and thickness as that used for adjacent pipe. Overlap adjoining pipe insulation by not less than 2 times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers, so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below-ambient services, provide a design that maintains vapor barrier.
   6. Insulate flanges, mechanical couplings, and unions using a section of oversized preformed pipe insulation to fit. Overlap adjoining pipe insulation by not less than 2 times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Stencil or label the outside insulation jacket of each union with the word "union" matching size and color of pipe labels.
   7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below-ambient services and a breather mastic for above-ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.

8. For services not specified to receive a field-applied jacket, except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing, using PVC tape.

C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

D. Install removable insulation covers. Installation shall conform to the following:
1. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as that of adjoining pipe insulation.
2. When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union at least 2 times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless steel or aluminum bands. Select band material compatible with insulation and jacket.
3. Construct removable valve insulation covers in same manner as for flanges, except divide the two-part section on the vertical center line of valve body.
4. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches (50 mm) over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.
5. Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.

3.6 INSTALLATION OF CALCIUM SILICATE INSULATION

A. Insulation Installation on Straight Pipes and Tubes:
1. Secure single-layer insulation with stainless steel bands at 12-inch (300-mm) intervals, and tighten bands without deforming insulation materials.
2. Install two-layer insulation with joints tightly butted and staggered at least 3 inches (75 mm). Secure inner layer with wire spaced at 12-inch (300-mm) intervals. Secure outer layer with stainless steel bands at 12-inch (300-mm) intervals.
3. Apply a skim coat of mineral-fiber, hydraulic-setting cement to insulation surface. When cement is dry, apply flood coat of lagging adhesive and press on one layer of glass cloth or tape. Overlap edges at least 1 inch (25 mm). Apply finish coat of lagging adhesive over glass cloth or tape. Thin finish coat to achieve smooth, uniform finish.

B. Insulation Installation on Pipe Flanges:
1. Install preformed pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.

3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of block insulation of same material and thickness as that of pipe insulation.
4. Finish flange insulation same as pipe insulation.

C. Insulation Installation on Pipe Fittings and Elbows:
1. Install preformed sections of same material as that of straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.
2. When preformed insulation sections of insulation are not available, install mitered sections of calcium silicate insulation. Secure insulation materials with wire or bands.
3. Finish fittings insulation same as pipe insulation.

D. Insulation Installation on Valves and Pipe Specialties:
1. Install mitered segments of calcium silicate insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
2. Install insulation to flanges as specified for flange insulation application.
3. Finish valve and specialty insulation same as pipe insulation.

3.7 INSTALLATION OF CELLULAR-GLASS INSULATION

A. Insulation Installation on Straight Pipes and Tubes:
1. Secure each layer of insulation to pipe with wire or bands, and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above-ambient services, secure laps with outward-clinched staples at 6 inches (150 mm) o.c.
4. For insulation with factory-applied jackets on below-ambient services, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive, as recommended by insulation material manufacturer, and seal with vapor-barrier mastic and flashing sealant.

B. Insulation Installation on Pipe Flanges:
1. Install preformed pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of cellular-glass block insulation of same thickness as that of pipe insulation.
4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch (25 mm), and seal joints with flashing sealant.

C. Insulation Installation on Pipe Fittings and Elbows:
1. Install preformed sections of same material as that of straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.
2. When preformed sections of insulation are not available, install mitered sections of cellular-glass insulation. Secure insulation materials with wire or bands.

D. Insulation Installation on Valves and Pipe Specialties:
   1. Install preformed sections of cellular-glass insulation to valve body.
   2. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
   3. Install insulation to flanges as specified for flange insulation application.

3.8 INSTALLATION OF FLEXIBLE ELASTOMERIC INSULATION

A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

B. Insulation Installation on Pipe Flanges:
   1. Install pipe insulation to outer diameter of pipe flange.
   2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
   3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of same thickness as that of pipe insulation.
   4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

C. Insulation Installation on Pipe Fittings and Elbows:
   1. Install mitered sections of pipe insulation.
   2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

D. Insulation Installation on Valves and Pipe Specialties:
   1. Install preformed valve covers manufactured of same material as that of pipe insulation when available.
   2. When preformed valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
   3. Install insulation to flanges as specified for flange insulation application.
   4. Secure insulation to valves and specialties, and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.9 FIELD-APPLIED JACKET INSTALLATION

A. Where glass-cloth jackets are indicated, install directly over bare insulation or insulation with factory-applied jackets.
   1. Draw jacket smooth and tight to surface with 2-inch (50-mm) overlap at seams and joints.
   2. Embed glass cloth between two 0.062-inch- (1.6-mm-) thick coats of lagging adhesive.
   3. Completely encapsulate insulation with coating, leaving no exposed insulation.

B. Where FSK jackets are indicated, install as follows:
   1. Draw jacket material smooth and tight.
   2. Install lap or joint strips with same material as jacket.

3. Secure jacket to insulation with manufacturer's recommended adhesive.
4. Install jacket with 1-1/2-inch (38-mm) laps at longitudinal seams and 3-inch- (75-mm-) wide joint strips at end joints.
5. Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-barrier mastic.

C. Where PVC jackets are indicated and for horizontal applications, install with 1-inch (25-mm) overlap at longitudinal seams and end joints. Seal with manufacturer's recommended adhesive.
1. Apply two continuous beads of adhesive to seams and joints, one bead under lap and the finish bead along seam and joint edge.

D. Where metal jackets are indicated, install with 2-inch (50-mm) overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless steel bands 12 inches (300 mm) o.c. and at end joints.

E. Where PVDC jackets are indicated, install as follows:
1. Apply three separate wraps of filament tape per insulation section to secure pipe insulation to pipe prior to installation of PVDC jacket.
2. Wrap factory-presized jackets around individual pipe insulation sections, with one end overlapping the previously installed sheet. Install presized jacket with an approximate overlap at butt joint of 2 inches (50 mm) over the previous section. Adhere lap seal using adhesive or SSL, and then apply 1-1/4 circumferences of appropriate PVDC tape around overlapped butt joint.
3. Continuous jacket can be spiral-wrapped around a length of pipe insulation. Apply adhesive or PVDC tape at overlapped spiral edge. When electing to use adhesives, refer to manufacturer's written instructions for application of adhesives along this spiral edge to maintain a permanent bond.
4. Jacket can be wrapped in cigarette fashion along length of roll for insulation systems with an outer circumference of 33-1/2 inches (850 mm) or less. The 33-1/2-inch- (850-mm-) circumference limit allows for 2-inch- (50-mm-) overlap seal. Using the length of roll allows for longer sections of jacket to be installed at one time. Use adhesive on the lap seal. Visually inspect lap seal for "fishmouthing," and use PVDC tape along lap seal to secure joint.
5. Repair holes or tears in PVDC jacket by placing PVDC tape over the hole or tear and wrapping a minimum of 1-1/4 circumferences to avoid damage to tape edges.

3.10 FINISHES

A. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.

B. Color: Final color as selected by Architect. Vary first and second coats to allow visual inspection of the completed Work.

C. Do not field paint aluminum or stainless steel jackets.

3.11 FIELD QUALITY CONTROL

A. Engage a qualified testing agency to perform tests and inspections.

B. Perform tests and inspections

C. All insulation applications will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

3.12 PIPING INSULATION SCHEDULE, GENERAL

A. Insulation conductivity and thickness per pipe size shall comply with schedules in this Section or with requirements of authorities having jurisdiction, whichever is more stringent.

B. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.

C. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
   1. Underground piping.
   2. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.13 PIPING INSULATION SCHEDULE

A. Fluid Operating Temperature Range below 40 Deg F:
   1. Minimum insulation thickness with k value 0.20-0.26 ((Btu*in)/(h*ft^2*F)):
      a. NPS less than 1 inch: 1/2 inches thick.
      b. NPS 1 inch to less than 8 inches: 1 inch thick.
      c. NPS 8 inches or greater: 1 1/2 inch thick.

B. Fluid Operating Temperature from 40 Deg F to 60 deg F:
   1. Minimum insulation thickness with k value 0.21-0.27 ((Btu*in)/(h*ft^2*F)):
      a. NPS less than 1 1/2 inches: 1/2 inches thick
      b. NPS 1 1/2 inches or greater: 1 inch thick

C. Fluid Operating Temperature from 105 Deg F to 140 deg F:
   1. Minimum insulation thickness with k value 0.21-0.28 ((Btu*in)/(h*ft^2*F)):
      a. NPS less than 1 1/2 inches: 1 inches thick
      b. NPS 1 1/2 inches or greater: 1-1/2 inches thick

D. Fluid Operating Temperature from 141 Deg F to 200 deg F:
   1. Minimum insulation thickness with k value 0.25-0.29 ((Btu*in)/(h*ft^2*F)):
      a. NPS less than 1 1/2 inches: 1-1/2 inches thick
      b. NPS 1 1/2 inches or greater: 2 inches thick

E. Fluid Operating Temperature from 201 Deg F to 250 deg F:
   1. Minimum insulation thickness with k value 0.27-0.30 ((Btu*in)/(h*ft^2*F)):
      a. NPS less than 4 inches: 2-1/2 inches thick
      b. NPS 4 inches or greater: 3 inches thick

F. Fluid Operating Temperature from 251 Deg F to 350 deg F:
   1. Minimum insulation thickness with k value 0.29-0.32 ((Btu*in)/(h*ft^2*F)):
      a. NPS less than 1 inch: 3 inches thick
      b. NPS 1 inch to less than 1-1/2 inches: 4 inches thick
      c. NPS 1-1/2 inches and greater: 4-1/2 inches thick

G. Fluid Operating Temperature from greater than 350 deg F:
   1. Minimum insulation thickness with k value 0.32-0.34 ((Btu*in)/(h*ft^2*F)):
      a. NPS less than 1 inch: 4-1/2 inches thick
      b. NPS 1 inch and greater: 5 inches thick

H. For insulation outside the state conductivity range, the minimum thickness (T) shall be as follows
   1. T = r{(1+t/r)K/k-1}
      a. T = minimum insulation thickness
      b. r = actual outside radius of pipe
      c. t = insulation thickness listed for applicable fluid temperature and pipe size
      d. K = conductivity of alternate material at mean rating temperature indicate for the applicable fluid temperature
      e. k = the upper value of the conductivity range listed in the table for the applicable fluid temperature

3.14 INDOOR, FIELD-APPLIED JACKET SCHEDULE

A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.

B. If more than one material is listed, selection from materials listed is Contractor's option.

C. Piping, Concealed:
   1. PVC, Color-Coded by System: 30 mils (0.8 mm) thick.
   2. Stainless Steel, Type 304 or Type 316, Smooth No. 2B Finish: 0.020 inch (0.51 mm) thick.

D. Piping, Exposed:
   1. None.

3.15 OUTDOOR, FIELD-APPLIED JACKET SCHEDULE

A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.

B. If more than one material is listed, selection from materials listed is Contractor's option.

C. Piping, Concealed:
   1. Stainless Steel, Type 304 or Type 316, Smooth No. 2B Finish: 0.020 inch (0.51 mm) thick.

D. Piping, Exposed:
   1. Stainless Steel, Type 304 or Type 316, Smooth No. 2B Finish: 0.020 inch (0.51 mm) thick.

3.16 UNDERGROUND, FIELD-APPLIED INSULATION JACKET

A. For underground direct-buried piping applications, install underground direct-buried jacket over insulation material.

END OF SECTION

SECTION 23 23 00 - REFRIGERANT PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Refrigerant pipes and fittings.
   2. Refrigerant piping valves and specialties.
   3. Refrigerants.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of valve, refrigerant piping, and piping specialty.
   1. Include pressure drop, based on manufacturer's test data, for the following:
      a. Thermostatic expansion valves.
      b. Solenoid valves.
      c. Hot-gas bypass valves.
      d. Filter dryers.
      e. Strainers.
      f. Pressure-regulating valves.

B. Shop Drawings:
   1. Show layout of refrigerant piping and specialties, including pipe, tube, and fitting sizes; flow capacities; valve arrangements and locations; slopes of horizontal runs; oil traps; double risers; wall and floor penetrations; and equipment connection details.
   2. Show piping size and piping layout, including oil traps, double risers, specialties, and pipe and tube sizes to accommodate, as a minimum, equipment provided, elevation difference between compressor and evaporator, and length of piping to ensure proper operation and compliance with warranties of connected equipment.
   3. Show interface and spatial relationships between piping and equipment.

1.3 INFORMATIONAL SUBMITTALS

A. Welding certificates.

B. Field quality-control reports.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For refrigerant valves and piping specialties to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to 2010 ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."

B. Comply with ASHRAE 15, "Safety Code for Refrigeration Systems."

C. Comply with ASME B31.5, "Refrigeration Piping and Heat Transfer Components."

1.6 PRODUCT STORAGE AND HANDLING

A. Store piping with end caps in place to ensure that piping interior and exterior are clean when installed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Line Test Pressure for Refrigerant R-410A:
   1. Suction Lines for Air-Conditioning Applications: 300 psig (2068 kPa).
   2. Suction Lines for Heat-Pump Applications: 535 psig (3689 kPa).
   3. Hot-Gas and Liquid Lines: 535 psig (3689 kPa).

2.2 COPPER TUBE AND FITTINGS

A. Copper Tube: ASTM B 88, Type K or L (ASTM B 88M, Type A or B)

B. Wrought-Copper Fittings: ASME B16.22.

C. Wrought-Copper Unions: ASME B16.22.

D. Solder Filler Metals: ASTM B 32. Use 95-5 tin antimony or alloy HB solder to join copper socket fittings on copper pipe.

E. Brazing Filler Metals: AWS A5.8/A5.8M.

F. Flexible Connectors:
   1. Body: Tin-bronze bellows with woven, flexible, tinned-bronze-wire-reinforced protective jacket.
   2. End Connections: Socket ends.
   3. Offset Performance: Capable of minimum 3/4-inch (20-mm) misalignment in minimum 7-inch- (180-mm-) long assembly.
   4. Working Pressure Rating: Factory test at minimum 500 psig (3450 kPa).
   5. Maximum Operating Temperature: 250 deg F (121 deg C).

G. Copper Pressure-Seal Fittings for Refrigerant Piping:
   1. Housing: Copper
   2. O-Rings: HNBR or compatible with specific refrigerant.

3. Tools: Manufacturer's approved special tools.
4. Minimum Rated Pressure: 700 psig (48 bar).

2.3 VALVES AND SPECIALTIES

A. Diaphragm Packless Valves:
1. Body and Bonnet: Forged brass or cast bronze; globe design with straight-through or angle pattern.
2. Diaphragm: Phosphor bronze and stainless steel with stainless-steel spring.
3. Operator: Rising stem and hand wheel.
4. Seat: Nylon.
5. End Connections: Socket, union, or flanged.
6. Working Pressure Rating: 500 psig (3450 kPa).
7. Maximum Operating Temperature: 275 deg F (135 deg C).

B. Packed-Angle Valves:
1. Body and Bonnet: Forged brass or cast bronze.
2. Packing: Molded stem, back seating, and replaceable under pressure.
3. Operator: Rising stem.
4. Seat: Nonrotating, self-aligning polytetrafluoroethylene.
5. Seal Cap: Forged-brass or valox hex cap.
6. End Connections: Socket, union, threaded, or flanged.
7. Working Pressure Rating: 500 psig (3450 kPa).
8. Maximum Operating Temperature: 275 deg F (135 deg C).

C. Check Valves:
1. Body: Ductile iron, forged brass, or cast bronze; globe pattern.
2. Bonnet: Bolted ductile iron, forged brass, or cast bronze; or brass hex plug.
3. Piston: Removable polytetrafluoroethylene seat.
4. Closing Spring: Stainless steel.
5. Manual Opening Stem: Seal cap, plated-steel stem, and graphite seal.
6. End Connections: Socket, union, threaded, or flanged.
7. Maximum Opening Pressure: 0.50 psig (3.4 kPa).
8. Working Pressure Rating: 500 psig (3450 kPa).
9. Maximum Operating Temperature: 275 deg F (135 deg C).

D. Service Valves:
1. Body: Forged brass with brass cap including key end to remove core.
2. Core: Removable ball-type check valve with stainless-steel spring.
3. Seat: Polytetrafluoroethylene.
4. End Connections: Copper spring.
5. Working Pressure Rating: 500 psig (3450 kPa).

E. Solenoid Valves: Comply with AHRI 760 and UL 429; listed and labeled by a National Recognized Testing Laboratory (NRTL).
1. Body and Bonnet: Plated steel.
2. Solenoid Tube, Plunger, Closing Spring, and Seat Orifice: Stainless steel.
3. Seat: Polytetrafluoroethylene.
4. End Connections: Threaded.

5. Electrical: Molded, watertight coil in NEMA 250 enclosure of type required by location with 1/2-inch (16-GRC) conduit adapter, and 24 or 115-V ac coil.
6. Working Pressure Rating: 400 psig (2760 kPa).
7. Maximum Operating Temperature: 240 deg F (116 deg C).

F. Safety Relief Valves: Comply with 2010 ASME Boiler and Pressure Vessel Code; listed and labeled by an NRTL.
1. Body and Bonnet: Ductile iron and steel, with neoprene O-ring seal.
2. Piston, Closing Spring, and Seat Insert: Stainless steel.
3. Seat: Polytetrafluoroethylene.
4. End Connections: Threaded.
5. Working Pressure Rating: 400 psig (2760 kPa).
6. Maximum Operating Temperature: 240 deg F (116 deg C).

G. Thermostatic Expansion Valves: Comply with AHRI 750.
1. Body, Bonnet, and Seal Cap: Forged brass or steel.
2. Diaphragm, Piston, Closing Spring, and Seat Insert: Stainless steel.
3. Packing and Gaskets: Non-asbestos.
4. Capillary and Bulb: Copper tubing filled with refrigerant charge.
5. Suction Temperature: 40 deg F (4.4 deg C)
6. Superheat: Adjustable.
7. Reverse-flow option (for heat-pump applications).
8. End Connections: Socket, flare, or threaded union.
9. Working Pressure Rating: 700 psig (4820 kPa)

H. Hot-Gas Bypass Valves: Comply with UL 429; listed and labeled by an NRTL.
1. Body, Bonnet, and Seal Cap: Ductile iron or steel.
2. Diaphragm, Piston, Closing Spring, and Seat Insert: Stainless steel.
3. Packing and Gaskets: Non-asbestos.
4. Solenoid Tube, Plunger, Closing Spring, and Seat Orifice: Stainless steel.
5. Seat: Polytetrafluoroethylene.
6. Equalizer: Internal.
7. Electrical: Molded, watertight coil in NEMA 250 enclosure of type required by location with 1/2-inch (16-GRC) conduit adapter and 24 or 115 -V ac coil.
8. End Connections: Socket.
9. Throttling Range: Maximum 5 psig (34 kPa).
10. Working Pressure Rating: 500 psig (3450 kPa).
11. Maximum Operating Temperature: 240 deg F (116 deg C).

I. Straight-Type Strainers:
1. Body: Welded steel with corrosion-resistant coating.
2. Screen: 100-mesh stainless steel.
3. End Connections: Socket or flare.
4. Working Pressure Rating: 500 psig (3450 kPa).
5. Maximum Operating Temperature: 275 deg F (135 deg C).

J. Angle-Type Strainers:
1. Body: Forged brass or cast bronze.
2. Drain Plug: Brass hex plug.
3. Screen: 100-mesh monel.
4. End Connections: Socket or flare.

5. Working Pressure Rating: 500 psig (3450 kPa).
6. Maximum Operating Temperature: 275 deg F (135 deg C).

K. Moisture/Liquid Indicators:
1. Body: Forged brass.
2. Window: Replaceable, clear, fused glass window with indicating element protected by filter screen.
3. Indicator: Color coded to show moisture content in parts per million (ppm).
4. Minimum Moisture Indicator Sensitivity: Indicate moisture above 60 ppm.
5. End Connections: Socket or flare.
6. Working Pressure Rating: 500 psig (3450 kPa).
7. Maximum Operating Temperature: 240 deg F (116 deg C).

L. Receivers: Comply with AHRI 495.
1. Comply with 2010 ASME Boiler and Pressure Vessel Code; listed and labeled by an NRTL.
2. Comply with UL 207; listed and labeled by an NRTL.
3. Body: Welded steel with corrosion-resistant coating.
4. Tappings: Inlet, outlet, liquid level indicator, and safety relief valve.
5. End Connections: Socket or threaded.
6. Working Pressure Rating: 500 psig (3450 kPa).
7. Maximum Operating Temperature: 275 deg F (135 deg C).

2.4 REFRIGERANTS

A. ASHRAE 34, R-410A: Pentafluoroethane/Difluoromethane.

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS FOR REFRIGERANT R-410A

A. Hot-Gas and Liquid Lines, and Suction Lines for Heat-Pump Applications: Copper, Type ACR or Type K (A) or Type L (B), drawn-temper tubing and wrought-copper fittings with 95-5 tin-antimony soldered joints.

B. Hot-Gas and Liquid Lines, and Suction Lines for Heat-Pump Applications: Copper, Type ACR or Type K (A) or Type L (B), drawn-temper tubing and wrought-copper fittings with Alloy HB soldered joints.

3.2 VALVE AND SPECIALTY APPLICATIONS

A. Install diaphragm packless or packed-angle valves in suction and discharge lines of compressor.

B. Install service valves for gage taps at inlet and outlet of hot-gas bypass valves and strainers if they are not an integral part of valves and strainers.

C. Install a check valve at the compressor discharge and a liquid accumulator at the compressor suction connection.

D. Except as otherwise indicated, install diaphragm packless or packed-angle valves on inlet and outlet side of filter dryers.

E. Install a full-size, three-valve bypass around filter dryers.

F. Install solenoid valves upstream from each expansion valve and hot-gas bypass valve. Install solenoid valves in horizontal lines with coil at top.

G. Install thermostatic expansion valves as close as possible to distributors on evaporators.
   1. Install valve so diaphragm case is warmer than bulb.
   2. Secure bulb to clean, straight, horizontal section of suction line using two bulb straps. Do not mount bulb in a trap or at bottom of the line.
   3. If external equalizer lines are required, make connection where it will reflect suction-line pressure at bulb location.

H. Install safety relief valves where required by 2010 ASME Boiler and Pressure Vessel Code. Pipe safety-relief-valve discharge line to outside according to ASHRAE 15.

I. Install moisture/liquid indicators in liquid line at the inlet of the thermostatic expansion valve or at the inlet of the evaporator coil capillary tube.

J. Install strainers upstream from and adjacent to the following unless they are furnished as an integral assembly for the device being protected:
   1. Solenoid valves.
   2. Thermostatic expansion valves.
   3. Hot-gas bypass valves.
   4. Compressor.

K. Install filter dryers in liquid line between compressor and thermostatic expansion valve, and in the suction line at the compressor.

L. Install receivers sized to accommodate pump-down charge.

M. Install flexible connectors at compressors.

3.3 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems; indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Shop Drawings.

B. Install refrigerant piping according to ASHRAE 15.

C. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

F. Install piping adjacent to machines to allow service and maintenance.

G. Install piping free of sags and bends.

H. Install fittings for changes in direction and branch connections.

I. Select system components with pressure rating equal to or greater than system operating pressure.

J. Install piping as short and direct as possible, with a minimum number of joints, elbows, and fittings.

K. Arrange piping to allow inspection and service of refrigeration equipment. Install valves and specialties in accessible locations to allow for service and inspection.

L. Install refrigerant piping in protective conduit where installed belowground.

M. Install refrigerant piping in rigid or flexible conduit in locations where exposed to mechanical injury.

N. Slope refrigerant piping as follows:
   1. Install horizontal hot-gas discharge piping with a uniform slope downward away from compressor.
   2. Install horizontal suction lines with a uniform slope downward to compressor.
   3. Install traps and double risers to entrain oil in vertical runs.
   4. Liquid lines may be installed level.

O. When brazing or soldering, remove solenoid-valve coils and sight glasses; also remove valve stems, seats, and packing, and accessible internal parts of refrigerant specialties. Do not apply heat near expansion-valve bulb.

P. Before installation of steel refrigerant piping, clean pipe and fittings using the following procedures:
   1. Shot blast the interior of piping.
   2. Remove coarse particles of dirt and dust by drawing a clean, lintless cloth through tubing by means of a wire or electrician's tape.
   3. Draw a clean, lintless cloth saturated with trichloroethylene through the tube or pipe. Continue this procedure until cloth is not discolored by dirt.
   4. Draw a clean, lintless cloth, saturated with compressor oil, squeezed dry, through the tube or pipe to remove remaining lint. Inspect tube or pipe visually for remaining dirt and lint.
   5. Finally, draw a clean, dry, lintless cloth through the tube or pipe.
   6. Safety-relief-valve discharge piping is not required to be cleaned but is required to be open to allow unrestricted flow.

Q. Install piping with adequate clearance between pipe and adjacent walls and hangers or between pipes for insulation installation.

3.4 PIPE JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

C. Fill pipe and fittings with an inert gas (nitrogen or carbon dioxide), during brazing or welding, to prevent scale formation.

D. Soldered Joints: Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook."

E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," Chapter "Pipe and Tube."
   1. Use Type BCuP (copper-phosphorus) alloy for joining copper socket fittings with copper pipe.
   2. Use Type BAg (cadmium-free silver) alloy for joining copper with bronze or steel.

F. Threaded Joints: Thread steel pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and to restore full ID. Join pipe fittings and valves as follows:
   1. Apply appropriate tape or thread compound to external pipe threads unless dry-seal threading is specified.
   2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

G. Steel pipe can be threaded, but threaded joints must be seal brazed or seal welded.

H. Welded Joints: Construct joints according to AWS D10.12M/D10.12.

I. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

3.5 INSTALLATION OF HANGERS AND SUPPORTS

A. Install the following pipe attachments:
   1. Adjustable steel clevis hangers for individual horizontal runs less than 20 feet (6 m) long.
   2. Roller hangers and spring hangers for individual horizontal runs 20 feet (6 m) or longer.
   3. Pipe Roller: MSS SP-58, Type 44 for multiple horizontal piping 20 feet (6 m) or longer, supported on a trapeze.
   4. Spring hangers to support vertical runs.
   5. Copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.

B. Install hangers for copper tubing, with maximum horizontal spacing and minimum rod diameters, to comply with MSS-58, locally enforced codes, and authorities having jurisdiction requirements, whichever are most stringent.

C. Support horizontal piping within 12 inches (300 mm) of each fitting.

D. Support vertical runs of copper tubing to comply with MSS-58, locally enforced codes, and authorities having jurisdiction requirements, whichever are most stringent.

3.6 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:
   1. Comply with ASME B31.5, Chapter VI.
   2. Test refrigerant piping, specialties, and receivers. Isolate compressor, condenser, evaporator, and safety devices from test pressure if they are not rated above the test pressure.
   3. Test high- and low-pressure side piping of each system separately at not less than the pressures indicated in "Performance Requirements" Article.

      a. Fill system with nitrogen to the required test pressure.
      b. System shall maintain test pressure at the manifold gage throughout duration of test.
      c. Test joints and fittings with electronic leak detector or by brushing a small amount of soap and glycerin solution over joints.
      d. Remake leaking joints using new materials, and retest until satisfactory results are achieved.

B. Prepare test and inspection reports.

3.7 SYSTEM CHARGING

A. Charge system using the following procedures:
   1. Install core in filter dryers after leak test but before evacuation.
   2. Evacuate entire refrigerant system with a vacuum pump to 500 micrometers (67 Pa). If vacuum holds for 12 hours, system is ready for charging.
   3. Break vacuum with refrigerant gas, allowing pressure to build up to 2 psig (14 kPa).
   4. Charge system with a new filter-dryer core in charging line.

3.8 ADJUSTING

A. Adjust thermostatic expansion valve to obtain proper evaporator superheat.

B. Adjust high- and low-pressure switch settings to avoid short cycling in response to fluctuating suction pressure.

C. Adjust set-point temperature of air-conditioning or chilled-water controllers to the system design temperature.

D. Perform the following adjustments before operating the refrigeration system, according to manufacturer's written instructions:
   1. Open shutoff valves in condenser water circuit.
   2. Verify that compressor oil level is correct.
   3. Open compressor suction and discharge valves.
   4. Open refrigerant valves except bypass valves that are used for other purposes.
   5. Check open compressor-motor alignment and verify lubrication for motors and bearings.

E. Replace core of replaceable filter dryer after system has been adjusted and after design flow rates and pressures are established.

END OF SECTION

SECTION 23 81 26 - SPLIT-SYSTEM AIR-CONDITIONERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes split-system air-conditioning and heat-pump units consisting of separate evaporator-fan and compressor-condenser components.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories. Include performance data in terms of capacities, outlet velocities, static pressures, sound power characteristics, motor requirements, and electrical characteristics.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
   1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
   2. Wiring Diagrams: For power, signal, and control wiring.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

B. Warranty: Sample of special warranty.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For split-system air-conditioning units to include in emergency, operation, and maintenance manuals.

1.5 QUALITY ASSURANCE

A. 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.

B. ASHRAE Compliance:
   1. Fabricate and label refrigeration system to comply with ASHRAE 15, "Safety Standard for Refrigeration Systems."
   2. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 4 - "Outdoor Air Quality," Section 5 - "Systems and Equipment," Section 6 - " Procedures," and Section 7 - "Construction and System Start-up."

C. ASHRAE/IES Compliance: Applicable requirements in ASHRAE/IES 90.1.

1.6 COORDINATION

A. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases.

B. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

1. Mitsubishi
2. Daikin
3. Trane
4. Carrier
5. Approved Equivalent

2.2 INDOOR UNITS (5 TONS (18 kW) OR LESS)

A. Concealed Evaporator-Fan Components:

1. Chassis: Galvanized steel with flanged edges, removable panels for servicing, and insulation on back of panel.
2. Insulation: Faced, glass-fiber duct liner.
3. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and thermal-expansion valve. Comply with ARI 206/110.
4. Water Coil: Copper tube, with mechanically bonded aluminum fins spaced no closer than 0.1 inch (2.5 mm); leak tested to 300 psig (2070 kPa) underwater; with a two-position control valve.
5. Electric Coil: Helical, nickel-chrome, resistance-wire heating elements; with refractory ceramic support bushings, automatic-reset thermal cutout, built-in magnetic contactors, manual-reset thermal cutout, airflow proving device, and one-time fuses in terminal box for overcurrent protection.
6. Fan: Forward-curved, double-width wheel of galvanized steel; directly connected to motor.
7. Fan Motors:

    a. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements specified in Section 230513 "Common Motor Requirements for HVAC Equipment."
    b. Multitapped, multispeed with internal thermal protection and permanent lubrication.
    c. Wiring Terminations: Connect motor to chassis wiring with plug connection.

8. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.
9. Filters: Permanent, cleanable.
10. Condensate Drain Pans:
    a. Factory Provided

B. Wall-Mounted, Evaporator-Fan Components:
1. Cabinet: Enameled steel with removable panels on front and ends in color selected by Architect, and discharge drain pans with drain connection.
2. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and thermal-expansion valve. Comply with ARI 206/110.
3. Electric Coil: Helical, nickel-chrome, resistance-wire heating elements; with refractory ceramic support bushings, automatic-reset thermal cutout, built-in magnetic contactors, manual-reset thermal cutout, airflow proving device, and one-time fuses in terminal box for overcurrent protection.
4. Fan: Direct drive, centrifugal.
5. Fan Motors:
    a. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements specified in Section 230513 "Common Motor Requirements for HVAC Equipment."
    b. Multitapped, multispeed with internal thermal protection and permanent lubrication.
    c. Enclosure Type: Totally enclosed, fan cooled.
    d. NEMA Premium (TM) efficient motors as defined in NEMA MG 1.
    e. Controllers, Electrical Devices, and Wiring: Comply with requirements for electrical devices and connections specified in electrical Sections.
    f. Mount unit-mounted disconnect switches on exterior of unit.
6. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.
7. Condensate Drain Pans:

    a. Factory provided

8. Air Filtration Section:

    a. General Requirements for Air Filtration Section:

        1) Comply with NFPA 90A.
        2) Minimum MERV according to ASHRAE 52.2.
        3) Filter-Holding Frames: Arranged for flat or angular orientation, with access doors on both sides of unit. Filters shall be removable from one side or lifted out from access plenum.

2.3 OUTDOOR UNITS (5 TONS (18 kW) OR LESS)

A. Air-Cooled, Compressor-Condenser Components:
1. Casing: Steel, finished with baked enamel in color selected by Architect, with removable panels for access to controls, weep holes for water drainage, and mounting holes in base. Provide brass service valves, fittings, and gage ports on exterior of casing.

2. Compressor: Hermetically sealed with crankcase heater and mounted on vibration isolation device. Compressor motor shall have thermal- and current-sensitive overload devices, start capacitor, relay, and contactor.
   a. Compressor Type: Scroll.
   b. Two-speed compressor motor with manual-reset high-pressure switch and automatic-reset low-pressure switch.
   c. Refrigerant: R-410A
   d. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and liquid subcooler. Comply with ARI 206/110.
3. Heat-Pump Components: Reversing valve and low-temperature-air cutoff thermostat.
4. Fan: Aluminum-propeller type, directly connected to motor.
5. Motor: Permanently lubricated, with integral thermal-overload protection.
6. Low Ambient Kit: Permits operation down to 45 deg F (7 deg C).
7. Mounting Base: Polyethylene.

2.4 ACCESSORIES

A. Thermostat: Wireless infrared functioning to remotely control compressor and evaporator fan, with the following features:
   1. Compressor time delay.
   2. 24-hour time control of system stop and start.
   3. Liquid-crystal display indicating temperature, set-point temperature, time setting, operating mode, and fan speed.
   4. Fan-speed selection including auto setting.

B. Automatic-reset timer to prevent rapid cycling of compressor.

C. Refrigerant Line Kits: Soft-annealed copper suction and liquid lines factory cleaned, dried, pressurized, and sealed; factory-insulated suction line with flared fittings at both ends.

D. Drain Hose: For condensate.

E. Monitoring:
   1. Monitor constant and variable motor loads.
   2. Monitor variable-frequency-drive operation.
   3. Monitor economizer cycle.
   4. Monitor cooling load.
   5. Monitor air distribution static pressure and ventilation air volumes.

2.5 CAPACITIES AND CHARACTERISTICS

A. See Schedule

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install units level and plumb.

B. Install evaporator-fan components using manufacturer's standard mounting devices securely fastened to building structure.

C. Install roof-mounted, compressor-condenser components on equipment supports specified in Section 077200 "Roof Accessories." Anchor units to supports with removable, cadmium-plated fasteners.

D. Equipment Mounting:
   1. Install ground-mounted, compressor-condenser components on cast-in-place concrete equipment base(s).
   2. Install ground-mounted, compressor-condenser components on polyethylene mounting base.

E. Install and connect precharged refrigerant tubing to component's quick-connect fittings. Install tubing to allow access to unit.

3.2 CONNECTIONS

A. Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Where piping is installed adjacent to unit, allow space for service and maintenance of unit.

3.3 FIELD QUALITY CONTROL

A. Perform tests and inspections.
   1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections:
   1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
   2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
   3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

C. Remove and replace malfunctioning units and retest as specified above.

D. Prepare test and inspection reports.

3.4 STARTUP SERVICE

A. Perform startup service.
   1. Complete installation and startup checks according to manufacturer's written instructions.

3.5 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain units.

END OF SECTION

SECTION 26 05 19 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Copper building wire rated 600 V or less.
   2. Connectors, splices, and terminations rated 600 V and less.

1.2 SUBMITTALS

A. Product Data: No submittals required when using specified materials with testing agency markings visible for inspection during construction.

B. Field quality-control reports.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.

B. Standards:
   1. Listed and labeled by a qualified testing agency, and marked for intended location and use.
   2. RoHS compliant.

C. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.

D. Conductor Insulation:
   1. Type THHN and Type THWN-2: Comply with UL 83.

2.2 CONNECTORS AND SPLICES

A. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled by a qualified testing agency, and marked for intended location and use.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

B. Power-Limited Fire Alarm and Control: Solid for No. 12 AWG and smaller.

3.2 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.

B. Complete raceway installation between conductor and cable termination points prior to pulling conductors and cables.

C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

3.3 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

3.4 IDENTIFICATION

A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."

3.5 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly.

3.6 CONDUCTOR MATERIAL APPLICATIONS

A. Branch Circuits: Copper. Solid for No. 10 AWG and smaller, stranded for No. 8 AWG and larger.

B. Power-Limited Fire Alarm and Control: Solid for No. 12 AWG and smaller.

3.7 FIELD QUALITY CONTROL

A. Perform tests and inspections.
   1. Perform each of the following visual and electrical tests:
      a. Inspect exposed sections of conductor and cable for physical damage and correct connection according to the single-line diagram.
      b. Test bolted connections for high resistance using one of the following:
         1) A low-resistance ohmmeter.
         2) Calibrated torque wrench.
         3) Thermographic survey.
      c. Inspect for correct identification.
      d. Continuity test on each conductor and cable.

B. Cables will be considered defective if they do not pass tests and inspections.

C. Prepare test and inspection reports to record the following:
   1. Procedures used.
   2. Results that comply with requirements.
   3. Results that do not comply with requirements, and corrective action taken to achieve compliance with requirements.

END OF SECTION

SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes grounding and bonding systems and equipment.

1.2 SUBMITTALS

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

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled by a qualified testing agency, and marked for intended location and application.

B. Comply with UL 467 for grounding and bonding materials and equipment.

2.2 CONDUCTORS

A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

2.3 CONNECTORS

A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

B. Water Pipe Clamps:
   1. Mechanical type, two pieces with stainless-steel bolts.
      a. Material: Die-cast zinc alloy.
   2. U-bolt type with malleable-iron clamp and copper ground connector.

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors: Install solid conductor for No. 10 AWG and smaller, and stranded conductors for No. 8 AWG and larger unless otherwise indicated.

3.2 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

3.3 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code.

B. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

END OF SECTION

SECTION 26 05 29 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Steel slotted support systems.
   2. Conduit and cable support devices.
   3. Mounting, anchoring, and attachment components, including powder-actuated fasteners, mechanical expansion anchors, concrete inserts, clamps, through bolts, toggle bolts, and hanger rods.

1.2 SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
      a. Slotted support systems, hardware, and accessories.
      b. Clamps.
      c. Hangers.
      d. Sockets.
      e. Eye nuts.
      f. Fasteners.
      g. Anchors.
      h. Saddles.
      i. Brackets.

   2. Include rated capacities and furnished specialties and accessories.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32-inch diameter holes at a maximum of 8 inches o.c. in at least one surface.
   1. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
   2. Material for Channel, Fittings, and Accessories: Galvanized steel.
   3. Channel Width: 1-5/8 inches.
   4. Metallic Coatings: Hot-dip galvanized after fabrication.

B. Conduit and Cable Support Devices: Steel, malleable-iron, or Stainless-steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

C. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
   1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened Portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
   2. Mechanical-Expansion Anchors: Insert-wedge-type, [zinc-coated] [stainless] steel, for use in hardened Portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
   3. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
   4. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
   5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
   6. Toggle Bolts: Stainless steel springhead type.
   7. Hanger Rods: Threaded steel.

PART 3 - EXECUTION

3.1 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.

B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

C. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
   1. To Wood: Fasten with lag screws or through bolts.
   2. To New Concrete: Bolt to concrete inserts.
   3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
   4. To Existing Concrete: Expansion anchor fasteners.
   5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
   6. To Steel: Beam clamps, complying with MSS SP-69.
   7. To Light Steel: Sheet metal screws.
   8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.

D. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

3.2 PAINTING

A. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply zinc-rich primer to comply with ASTM A 780.

END OF SECTION

SECTION 26 05 33 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Metal conduits, tubing, and fittings.
   2. Surface raceways.
   3. Boxes, enclosures, and cabinets.

1.2 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. FMC: Flexible metallic conduit.

C. IMC: Intermediate metal conduit.

D. LFMC: Liquidtight flexible metallic conduit.

E. RGS: Rigid galvanized steel conduit.

1.3 SUBMITTALS

A. Product Data: No submittal required when using listed materials with testing agency markings visible for inspection during construction.

PART 2 - PRODUCTS

2.1 METAL CONDUITS, TUBING, AND FITTINGS

A. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. RGS: Comply with ANSI C80.1 and UL 6.

C. IMC: Comply with ANSI C80.6 and UL 1242.

D. EMT: Comply with ANSI C80.3 and UL 797.

E. FMC: Comply with UL 1; zinc-coated steel or aluminum.

F. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

G. Fittings for Metal Conduit:
   1. Comply with NEMA FB 1 and UL 514B.
   2. Fittings for EMT:
      a. Material: Steel or die cast.
      b. Type: Compression type only.

H. Joint Compound for IMC and RGS: Approved by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 SURFACE RACEWAYS

A. Listing and Labeling: Listed and labeled by a qualified testing agency, and marked for intended location and application.

B. Surface Metal Raceways: Galvanized steel with snap-on covers complying with UL 5. Prime coated, ready for field painting.

2.3 BOXES, ENCLOSURES, AND CABINETS

A. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.

B. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

C. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy or aluminum, Type FD, with gasketed cover.

D. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

E. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum or galvanized cast iron with gasketed cover.

F. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

G. Device Box Dimensions: 4 inches square by 2-1/8 inches deep or 2-1/4 inches by 2-1/8 inches deep.

H. Gangable boxes are prohibited.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.

B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

C. Complete raceway installation before starting conductor installation.

D. Arrange stub-ups so curved portions of bends are not visible above finished slab.

E. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

F. Support conduit within 12 inches of enclosures to which attached.

G. Stub-ups to Above Recessed Ceilings:
   1. Use EMT, IMC, or RGS for raceways.
   2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

H. Threaded Conduit Joints, Exposed to Wet, Damp, or Corrosive Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

I. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.

J. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4 inch trade size and insulated throat metal bushings on 1-1/2 inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.

K. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

L. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.

M. Cut conduit perpendicular to the length. For conduits 2 inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.

N. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200 lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.

O. Surface Raceways:
   1. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.

P. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for recessed and semirecessed luminaires,]quipment subject to vibration, noise transmission, or movement; and for transformers and motors.
   1. Use LFMC in damp or wet locations.

Q. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.

R. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.

S. Locate boxes so that cover or plate will not span different building finishes.

T. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

3.2 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies.

3.3 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.
   1. Repair damage to galvanized finishes with zinc-rich primer.

END OF SECTION

SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Color and legend requirements.
   2. Labels.
   3. Tape.

PART 2 - PRODUCTS

2.1 COLOR AND LEGEND REQUIREMENTS

A. Conductor Color Coding for Phase Voltage-Level Identification, 600 V or Less: Use colors listed below.
   1. Color shall be factory applied or field applied for sizes larger than No. 8 AWG.
   2. Colors for 208Y/120V Circuits:
      a. Phase A: Black.
      b. Phase B: Red.
      c. Phase C: Blue.
      d. Neutral: White

   3. Color for Insulated Equipment Grounds: Green.

2.2 LABELS

A. Self-Adhesive Labels: Thermal, transfer-printed, 3 mil thick, multicolor, weather and UV resistant, pressure-sensitive adhesive labels, configured for intended use and location.

2.3 TAPE

A. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils thick. Compounded for outdoor use.

PART 3 - EXECUTION

3.1 PREPARATION

A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

3.2 INSTALLATION

A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.

B. Verify identity of each item before installing identification products.

C. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.

D. Apply identification devices to surfaces that require finish after completing finish work.

E. Self-Adhesive Labels:
   1. On each item, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual.
   2. Unless otherwise indicated, provide a single line of text with 1/2-inch high letters on 1-1/2-inch high label; where two lines of text are required, use labels 2 inches high.

F. Self-Adhesive Vinyl Tape: Secure tight to surface at a location with high visibility and accessibility.
   1. Field-Applied, Color Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding.

3.3 IDENTIFICATION SCHEDULE

A. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility. Identify by system and circuit designation.

B. Instructional Signs: Self-adhesive labels, including NEC required conductor color code identification for grounded and ungrounded conductors.

END OF SECTION

SECTION 26 09 23 - LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Indoor occupancy sensors.

1.2 SUBMITTALS

A. Product Data: For each type of product.

B. Operation and Maintenance Data: For each type of lighting control device to include in operation and maintenance manuals.

1.3 WARRANTY

A. Contractor's Warranty: Contractor agrees to repair or replace lighting control devices that fail in materials or workmanship within two (2) years of Substantial Completion.

PART 2 - PRODUCTS

2.1 INDOOR OCCUPANCY SENSORS

A. General Requirements for Sensors:
   1. Ceiling and switch box mounted, solid-state indoor occupancy sensors.
   2. Dual technology.
   3. Separate power pack.
   4. Hardwired connections.
   5. Operation:
      a. Occupancy Sensor: Unless otherwise indicated, turn lights on when coverage area is occupied, and turn them off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
      b. Sensor shall "fail-on".
   6. Sensor Output: Contacts rated to operate the connected relay, complying with UL 773A.
   7. Power: Line voltage.
   8. Power Pack: Dry contacts rated for 20 A inductive or LED load at 120Volts Sensor has 24 V dc, 150 mA, Class 2 power source, as defined by NFPA 70.

9. Mounting:
    a. Sensor: Suitable for mounting in any position on a standard outlet box.
    b. Relay: Externally mounted through a 1/2 inch knockout in a standard electrical enclosure.
    c. Time-Delay and Sensitivity Adjustments: Recessed and concealed behind hinged door.
10. Indicator: Digital display, to show when motion is detected during testing and normal operation of sensor.
11. Bypass Switch: Override the "on" function in case of sensor failure.

B. Dual-Technology Type: Detect occupants in coverage area using PIR and ultrasonic detection methods. The particular technology or combination of technologies that control on-off functions is selectable in the field by operating controls on unit.
    1. Sensitivity Adjustment: Separate for each sensing technology.
    2. Detector Sensitivity: Detect occurrences of 6 inch minimum movement of any portion of a human body that presents a target of not less than 36 sq. in., and detect a person of average size and weight moving not less than 12 inches in either a horizontal or a vertical manner at an approximate speed of 12 inches/s.
    3. Detection Coverage (Standard Room): Detect occupancy anywhere within a circular area of 1000 square feet when mounted on a 96 inch high ceiling.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine lighting control devices before installation. Reject lighting control devices that are wet, moisture damaged, or mold damaged.

B. Examine walls and ceilings for suitable conditions where lighting control devices will be installed.

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

3.2 INSTALLATION

A. Comply with NECA 1.

B. Coordinate layout and installation of ceiling-mounted devices with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, smoke detectors, fire-suppression systems, and partition assemblies.

C. Install sensors in locations to achieve not less than 90-percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions.

3.3 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:
   1. Operational Test: After installing time switches and sensors, and after electrical circuitry has been energized, start units to confirm proper unit operation.
   2. Test and adjust controls. Replace damaged and malfunctioning controls and equipment.

B. Lighting control devices will be considered defective if they do not pass tests and inspections.

C. Prepare test and inspection reports.

3.4 ADJUSTING

A. Occupancy Adjustments: When requested within 12 months from date of Substantial Completion, provide on-site assistance in adjusting lighting control devices to suit actual occupied conditions. Provide visit to Project during other-than-normal occupancy hours for this purpose.
   1. For occupancy sensors, verify operation at outer limits of detector range. Set time delay to suit Owner's operations.

END OF SECTION

SECTION 26 27 26 - WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Receptacles.
   2. GFCI receptacles, 125 V, 20 A.

1.2 SUBMITTALS

A. Product Data: For each type of product.

B. Field quality-control reports.

PART 2 - PRODUCTS

2.1 GENERAL WIRING-DEVICE REQUIREMENTS

A. Wiring Devices, Components, and Accessories: Listed and labeled by a qualified testing agency, and marked for intended location and use.

B. Comply with NFPA 70.

C. RoHS compliant.

D. Comply with NEMA WD 1.

E. Device Color: White.

F. Wall Plate Color: For plastic covers, match device color.

G. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 SPECIFICATION-GRADE RECEPTACLES, 125 V, 20 A

A. Duplex Receptacles, 125 V, 20 A :
   1. Description: Two pole, three wire, and self-grounding.
   2. Configuration: NEMA WD 6, Configuration 5-20R.
   3. Standards: Comply with UL 498 and FS W-C-596.

2.3 GFCI RECEPTACLES, 125 V, 20 A

A. Duplex GFCI Receptacles, 125 V, 20 A:
   1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light.
   2. Two pole, three wire, and self-grounding.
   3. Configuration: NEMA WD 6, Configuration 5-20R.
   4. Type: Feed through.
   5. Standards: Comply with UL 498, UL 943 Class A, and FS W-C-596.

2.4 WALL PLATES

A. Plate-Securing Screws: Metal with head color to match plate finish.

B. Material for Finished Spaces: Smooth, high-impact thermoplastic 0.035-inch thick, unless noted otherwise.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

B. Coordination with Other Trades:
   1. Protect installed devices and their boxes.
   2. Do not place wall finish materials over device boxes.
   3. Do not cut holes for boxes with routers that are guided by riding against outside of boxes.
   4. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
   5. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:
   1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
   2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
   3. The length of free conductors at outlets for devices shall comply with NFPA 70, Article 300, without pigtails.
   4. Existing Conductors:
      a. Cut back and pigtail, or replace all damaged conductors.
      b. Straighten conductors that remain and remove corrosion and foreign matter.
      c. Pigtailing existing conductors is permitted, provided the outlet box is large enough.

D. Device Installation:
   1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
   2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
   3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
   4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
   5. Use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
   6. Tighten unused terminal screws on the device.
   7. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

E. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

3.2 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:
   1. Test Instrument for Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.
   2. Tests for Receptacles:
      a. Line Voltage: Acceptable range is 105 to 132 V.
      b. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
      c. Using the test plug, verify that the device and its outlet box are securely mounted.
      d. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault-current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

B. Wiring device will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

END OF SECTION

SECTION 26 51 19 - LED INTERIOR LIGHTING

PART 1 - PART 1 - GENERAL

1.1 SUMMARY

A. Section includes interior LED luminaires.

1.2 SUBMITTALS

A. Product Data: For each type of product.
   1. Arrange in order of luminaire designation.
   2. Include data on features, accessories, and finishes.
   3. Include physical description and dimensions of luminaires.
   4. Include emergency lighting units, including batteries and chargers.
   5. Include life, output (lumens, CCT, and CRI), and energy efficiency data.
   6. Photometric data and adjustment factors based on laboratory tests. The adjustment factors shall be IES LM-79 and IES LM-80.

B. Operation and Maintenance Data: For luminaires and lighting systems to include in operation and maintenance manuals.

1.3 QUALITY ASSURANCE

A. Provide luminaires from a single manufacturer for each luminaire type.

B. Each luminaire type shall be binned within a three-step MacAdam Ellipse to ensure color consistency among luminaires.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering before shipping.

1.5 WARRANTY

A. Warranty: Manufacturer agrees to repair or replace components of luminaires that fail in materials or workmanship within Five (5) years of date of Substantial Completion.

PART 2 - PRODUCTS

2.1 LUMINAIRE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled by a qualified testing agency, and marked for intended location and application.

B. Internal driver.

2.2 MATERIALS

A. Metal Parts:
   1. Free of burrs and sharp corners and edges.
   2. Sheet metal components shall be steel unless otherwise indicated.
   3. Form and support to prevent warping and sagging.

B. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during maintenance and when secured in operating position.

C. Diffusers:
   1. Acrylic or UV-stabilized polycarbonate.
      a. Acrylic Diffusers: One hundred percent virgin acrylic plastic, with high resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
   2. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.

D. Factory-Applied Labels: Comply with UL 1598. Locate labels where they will be readily visible to service personnel, but not seen from normal viewing angles.

E. Finishes:
   1. Variations in finishes are unacceptable in the same piece.
   2. Variations in finishes of adjoining components are acceptable if they can be and are assembled or installed to minimize contrast.

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 luminaire to verify actual locations of luminaire and electrical connections before luminaire installation. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with NECA 1.

B. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.

C. Supports:
   1. Sized and rated for luminaire weight.
   2. Able to maintain luminaire position after cleaning and maintenance.
   3. Provide support for luminaire without causing deflection of ceiling or wall.
   4. Luminaire mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and vertical force of 400 percent of luminaire weight.
   5. Ceiling-Grid-Mounted Luminaires:Use approved devices and support components to connect luminaire to ceiling grid and building structure in a minimum of four locations, spaced near corners of luminaire.

3.3 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:
   1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
   2. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery power and retransfer to normal.

B. Luminaire will be considered defective if it does not pass operation tests and inspections.

C. Prepare test and inspection reports.

END OF SECTION