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Architecture

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Master Planning

Alabama A&M University Knight Complex Cafeteria Renovation 4900 Meridian Street North Normal, Alabama 35762

FINAL SUBMITTAL

Joseph A. Fuqua Rodney K. Steger Bart G. Bankowski Leslie N. Tillery



PROJECT MANUAL

FPA Project No. 02419 DCM # 2018446

MAY 1, 2020

Fuqua & Partners Architects, P.C. 100 Church Street, Suite 700 Huntsville, Alabama 35801 phone: 256.534.3516 fax: 256.533.4605 www.fuquaarchitects.com

000000 - A&M- Front Cover

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PROJECT:

Alabama A&M University Knight Complex Cafeteria Renovations

PROJECT RELEASE DATE: May 1, 2020

ARCHITECT'S PROJECT NUMBER: 02419

DCM PROJECT NUMBER: 2018446

OWNER:

Alabama A&M University 4900 Meridian Street North

ARCHITECT:

Normal, AL 35811-7500 Fuqua & Partners Architects. PC. 100 Church Street Suite 700 Huntsville, AL 35801 256-534-3516



Responsible for Sections: 00 22 13, 00 43 21, 00 43 22, 01 10 00, 01 21 00, 01 22 00, 01 25 00, 01 29 00, 01 31 00, 01 32 00, 01 33 00, 01 40 00, 01 42 00, 01 50 00, 01 60 00, 01 73 00, 01 77 00, 01 78 23, 01 78 39, 02 41 19, 03 30 00, 03 54 16, 06 10 00, 06 20 23, 06 41 16, 07 81 23, 07 84 43, 08 11 13, 08 33 00, 08 71 00, 08 80 00, 09 22 16, 09 29 00, 09 30 13, 09 51 13, 09 58 13, 09 65 13, 09 65 40, 09 68 13, 09 72 00, 09 91 23, 11 40 00, 12 36 61.19.

Joseph A. Fuqua, # 2268

STRUCTURAL:

ELM Structural Engineers 2707 Artie Street Building 100 Suite 2 Huntsville, Al 35805 256-864-2542 Will L. Lindsey, P.E. #35621 Specifications provided on Sheet S0.1.



MECHANICAL & PLUMBING:

Responsible for Sections:

Mechanical Design Services 100 Church Street S.W. Suite 650 Huntsville, Alabama 35801 256-534-5150 Andrew Holmes, P.E. #



Responsible for Sections: 21 00 00, 21 05 00, 21 05 53, 21 13 13, 22 00 00, 22 05 00, 22 05 32, 22 05 53, 22 05 60, 22 07 10, 22 11 10, 22 13 10, 22 42 10, 23 00 00, 23 05 00, 23 05 32, 23 05 53, 23 05 60, 23 05 91, 23 07 10, 23 31 10, 23 43 19.

ELECTRICAL:

Consulting Construction Engineering 110 12th Street North Birmingham, Alabama 35203 205-352-2500 Jamie L. Bailey, P.E. #31921



Responsible for Sections: 26 00 00.

ADVERTISEMENT FOR BIDS

Sealed proposals will be received by Alabama A&M University at the office of the Alabama A&M University Department of Purchasing, Room 305 Patton Hall, 4210 Morrison Circle, Normal, Alabama 35762 TDB pm CST for: Alabama A&M University Knight Complex Cafeteria Renovation at which time and place they will be publicly opened and read.

A cashier's check or bid bond payable to The University of Alabama in Huntsville in an amount not less than five (5) percent of the amount of the bid, but in no event more than \$10,000, must accompany the bidder's proposal. Performance and Payment Bonds and evidence of insurance required in the bid documents will be required at the signing of the Contract.

A Pre-Bid Meeting will take place prior to the Bid Opening TBD. The meeting will take place at the Alabama A&M Knight Cafeteria Complex, 4900 Meridian Street North, Normal, Alabama 35762.

Drawings and specifications may be examined at the Alabama A&M University, Facilities and Administrative Services Office at 453 Buchanan Way, Normal, AL 35762.

Contact Fuqua & Partners Architects at (256) 534-3516 to obtain Bid Documents.

In addition, printed bid documents may be obtained from Datatek at 2809 Newby Road Suite 123, Huntsville, Alabama 35805, printing costs will not be refunded. Subcontractors and suppliers may obtain drawings and specifications (bid documents) thru a General Contractor, Datatek, or one of the following plan rooms: Dodge Data & Analytics and iSqFt, A ConstructConnect Company.

Bids must be submitted on proposal forms furnished by the Architect or copies thereof. All bidders bidding in amounts exceeding that established by the State Licensing Board for General Contractors must be licensed under the provisions of Title 34, Chapter 8, Code of Alabama, 1975, and must show evidence of license before bidding or bid will not be received or considered by the Architect (Engineer); the bidder shall show such evidence by clearly displaying his or her current license number on the outside of the sealed envelope in which the proposal is delivered. The Owner reserves the right to reject any or all proposals and to waive technical errors if, in the Owner's judgment, the best interests of the Owner will thereby be promoted.

Alabama Law (Section 41-4-116, Code of Alabama 1975) provides that every bid submitted and contract executed shall contain a certification that the vendor, contractor, and all of its affiliates that make sales for delivery into Alabama or leases for use in Alabama are registered, collecting, and remitting Alabama state and local sales, use, and/or lease tax on all taxable sales and leases into Alabama.

Alabama Immigration Law (Act 2011-535 and codified in state law as Title 31, Chapter 13 of the Code of Alabama 1975, amended by Act No. 2012-491) requires the University to require all Contractors to enroll in the E-Verify program and to provide documentation of enrollment in the E-Verify program with their contracts or agreements. This is applicable to all General Contractors and Subcontractors performing work on a University project.

Alabama A&M University (Awarding Authority) Fuqua & Partners Architects, P.C. (Architect)

NOTE: For projects exceeding \$50,000, this notice must be run once a week for three successive weeks in a newspaper of general circulation in the county or counties in which the project, or any part of the project, is to be performed. If the project involve an estimated amount exceeding \$500,000, this notice must also be run at least once in three newspapers of general circulation throughout the state. Proof of publication is required.

INSTRUCTIONS TO BIDDERS

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1. BID DOCUMENTS:

The Bid Documents consist of the Advertisement for Bids, these Instructions to Bidders, any modifications of or supplements to these Instructions to Bidders, the Proposal Form and the Accounting of Sales Tax, and the proposed Contract Documents. The proposed Contract Documents consist of the Construction Contract, the Performance Bond and Payment Bond, the Conditions of the Contract (General, Supplemental, and other Conditions), Drawings, Specifications and all addenda issued prior to execution of the Construction Contract. Bid Documents may be obtained or examined as set forth in the Advertisement for Bids.

2. GENERAL CONTRACTOR'S STATE LICENSING REQUIREMENTS:

When the amount bid for a contract exceeds \$50,000, the bidder must be licensed by the State Licensing Board for General Contractors and must show the Architect evidence of license before bidding or the bid will not be received by the Architect or considered by the Awarding Authority. A bid exceeding the bid limit stipulated in the bidder's license, or which is for work outside of the type or types of work stipulated in the bidder's license, will not be considered. In case of a joint venture of two or more contractors, the amount of the bid shall be within the maximum bid limitation as set by the State Licensing Board for General Contractors of the combined limitations of the partners to the joint venture.

3. QUALIFICATIONS of BIDDERS and PREQUALIFICATION PROCEDURES:

a. Any special qualifications required of general contractors, subcontractors, material suppliers, or fabricators are set forth in the Bid Documents.

b. The Awarding Authority may have elected to prequalify bidders. Parties interested in bidding for this contract are directed to the Advertisement for Bids and Supplemental Instructions to Bidders to determine whether bidders must be prequalified and how they may obtain copies of the Awarding Authority's published prequalification procedures and criteria.

c. Release of Bid Documents by the Architect to a prospective bidder will not constitute any determination by the Awarding Authority or Architect that the bidder has been found to be qualified, prequalified, or responsible.

4. **PREFERENCE to RESIDENT CONTRACTORS:**

(If this project is federally funded in whole or in part, this Article shall not apply.)

a. In awarding the Contract, preference will be given to Alabama resident contractors and a nonresident bidder domiciled in a state having laws granting preference to local contractors shall be awarded the Contract only on the same basis as the nonresident bidder's state awards contracts to Alabama contractors bidding under similar circumstances.

b. A nonresident bidder is a contractor which is neither organized and existing under the laws of the State of Alabama, nor maintains its principal place of business in the State of Alabama. A nonresident contractor which has maintained a permanent office within the State of Alabama for at least five continuous years shall not thereafter be deemed to be a non-resident contractor so long as the contractor continues to maintain a branch office within Alabama.

5. EXAMINATION of BID DOCUMENTS and the SITE of the WORK:

Before submitting a bid for the Work, the bidders shall carefully examine the Bid Documents, visit the site, and satisfy themselves as to the nature and location of the Work, and the general and local conditions, including weather, the general character of the site or building, the character and extent of existing work within or adjacent to the site and any other work being performed thereon at the time of submission of their bids. They shall obtain full knowledge as to transportation, disposal, handling, and storage of materials, availability of water, electric power, and all other facilities in the area which will have a bearing on the performance of the Work for which they submit their bids. The submission of a bid shall constitute a representation by the bidder that the bidder has made such examination and visit and has judged for and satisfied himself or herself as to conditions to be encountered regarding the character, difficulties, quality, and quantities of work to be performed and the material and equipment to be furnished, and as to the contract requirements involved.

6. EXPLANATIONS and INTERPRETATIONS:

a. Should any bidder observe any ambiguity, discrepancy, omission, or error in the drawings and specifications, or in any other bid document, or be in doubt as to the intention and meaning of these documents, the bidder should immediately report such to the Architect and request clarification.

b. Clarification will be made only by written Addenda sent to all prospective bidders. Neither the Architect nor the Awarding Authority will be responsible in any manner for verbal answers or instructions regarding intent or meaning of the Bid Documents.

c. In the case of inconsistency between drawings and specifications or within either document, a bidder will be deemed to have included in its bid the better quality or greater quantity of the work involved unless the bidder asked for and obtained the Architect's written clarification of the requirements before submission of a bid.

7. SUBSTITUTIONS:

a. The identification of any product, material, system, item of equipment, or service in the Bid Documents by reference to a trade name, manufacturer's name, model number, etc. (hereinafter referred to as "source"), is intended to establish a required standard of performance, design, and quality and is not intended to limit competition unless the provisions of paragraph "d" below apply.

b. When the Bid Documents identify only one or two sources, or three or more sources followed by "or approved equal" or similar wording, the bidder's proposal may be based on a source not identified but considered by the bidder to be equal to the standard of performance, design and quality as specified; however, such substitutions must ultimately be approved by the Architect. If the bidder elects to bid on a substitution without "Pre-bid Approval" as described below, then it will be understood that proof of compliance with specified requirements is the exclusive responsibility of the bidder.

c. When the Bid Documents identify three or more sources and the list of sources is not followed by "or approved equal" or similar wording, the bidder's proposal shall be based upon one of the identified sources, unless the bidder obtains "Pre-bid Approval" of another source as described below. Under these conditions it will be expressly understood that no product, material, system, item of equipment, or service that is not identified in the Bid Documents or granted "Pre-Bid Approval" will be incorporated into the Work unless such substitution is authorized and agreed upon through a Contract Change Order.

d. If the Bid Documents identify only one source and expressly provide that it is an approved sole source for the product, material, system, item of equipment, or service, the bidder's proposal must be based upon the identified sole source.

Procedures for "Pre-bid Approval". If it is desired that a product, material, system, e. piece of equipment, or service from a source different from those sources identified in the Bid Documents be approved as an acceptable source, application for the approval of such source must reach the hands of the Architect at least ten days prior to the date set for the opening of bids. At the Architect's discretion, this ten day provision may be waived. The application for approval of a proposed source must be accompanied by technical data which the applicant desires to submit in support of the application. The Architect will give consideration to reports from reputable independent testing laboratories, verified experience records showing the reputation of the proposed source with previous users, evidence of reputation of the source for prompt delivery, evidence of reputation of the source for efficiency in servicing its products, or any other pertinent written information. The application to the Architect for approval of a proposed source must be accompanied by a schedule setting forth in which respects the materials or equipment submitted for consideration differ from the materials or equipment designated in the Bid Documents. The burden of proof of the merit of the proposed substitution is upon the proposer. To be approved, a proposed source must also meet or exceed all express requirements of the Bid Documents. Approval, if granted, shall not be effective until published by the Architect in an addendum to the Bid Documents.

8. PREPARATION and DELIVERY of BIDS:

a. DCM Form C-3: Proposal Form:

(1) Bids must be submitted on the Proposal Form as contained in the Bid Documents; only one copy is required to be submitted. A completed DCM Form C-3A: Accounting of Sales Tax must be submitted with the Proposal Form.

(2) All information requested of the bidder on the Proposal Form must be filled in. The form must be completed by typewriter or hand-printed in ink.

(3) Identification of Bidder: On the first page of the Proposal Form the bidder must be fully identified by completing the spaces provided for:

- (a) the legal name of the bidder,
- (b) the state under which laws the bidder's business is organized and existing,
- (c) the city (and state) in which the bidder has its principal offices,
- (d) the bidder's business organization, i.e., corporation, partnership, or individual (to be indicated by marking the applicable box and writing in the type of organization if it is not one of those listed), and
- (e) the partners or officers of the bidder's organization, if the bidder is other than an individual. If the space provided on the Proposal Form is not adequate for this listing, the bidder may insert "See Attachment" in this space and provide the listing on an attachment to the Proposal Form.

(4) Where indicated by the format of the Proposal Form, the bidder must specify lump sum prices in both words and figures. In case of discrepancy between the prices shown in words and in figures, the words will govern.

(5) All bid items requested in the Proposal Form, including alternate bid prices and unit prices for separate items of the Work, must be bid. If a gross sum of bid items is requested in the Proposal Form, the gross sum shall be provided by the bidder.

(6) In the space provided in the Proposal Form under "Bidder's Alabama License", the bidder must insert his or her current general contractor's state license number, current bid limit, and type(s) of work for which bidder is licensed.

- (7) The Proposal Form shall be properly signed by the bidder. If the bidder is:
 - (a) an individual, that individual or his or her "authorized representative" must sign the Proposal Form;
 - (b) a partnership, the Proposal Form must be signed by one of the partners or an "authorized representative" of the Partnership;
 - (c) a corporation, the president, vice-president, secretary, or "authorized representative" of the corporation shall sign and affix the corporate seal to the Proposal Form.

As used in these Instructions to Bidders, "authorized representative" is defined as a person to whom the bidder has granted written authority to conduct business in the bidder's behalf by signing and/or modifying the bid. Such written authority shall be signed by the bidder (the individual proprietor, or a member of the Partnership, or an officer of the Corporation) and shall be attached to the Proposal Form.

(8) Interlineation, alterations or erasures on the Proposal Form must be initialed by the bidder or its "authorized representative".

b. DCM Form C-3A: Accounting of Sales Tax

A completed DCM Form C-3A: Accounting of Sales Tax must be submitted with DCM Form C-3: Proposal Form. Submission of DCM Form C-3A is required, it is not optional. A proposal shall be rendered non-responsive if an Accounting of Sales Tax is not provided.

c. Bid Guaranty

(1) The Proposal Form must be accompanied by a cashier's check, drawn on an Alabama bank, or a Bid Bond, executed by a surety company duly authorized and qualified to make such bonds in the State of Alabama, payable to the Awarding Authority.

(2) If a Bid Bond is provided in lieu of a cashier's check, the bond shall be on the Bid Bond form as stipulated in the Bid Documents.

(3) The amount of the cashier's check or Bid Bond shall not be less than five percent of the contractor's bid, but is not required to be in an amount more than ten thousand dollars.

d. Delivery of Bids:

(1) Bids will be received until the time set, and at the location designated, in the Advertisement for Bids unless notice is given of postponement. Any bid not received prior to the time set for opening bids will be rejected absent extenuating circumstances and such bids shall be rejected in all cases where received after other bids are opened.

(2) Each bid shall be placed, together with the bid guaranty, in a sealed envelope. On the outside of the envelope the bidder shall write in large letters "Proposal", below which the bidder shall identify the Project and the Work bid on, the name of the bidder, and the bidder's current general contractor's state license number.

(3) Bids may be delivered in person, or by mail if ample time is allowed for delivery. When sent by mail, the sealed envelope containing the bid, marked as indicated above, shall be enclosed in another envelope for mailing.

9. WITHDRAWAL or REVISION of BIDS:

a. A bid may be withdrawn prior to the time set for opening of bids, provided a written request, executed by the bidder or the bidder's "authorized representative", is filed with the Architect prior to that time. The bid will then be returned to the bidder unopened.

b. A bid which has been sealed in its delivery envelope may be revised by writing the change in price on the outside of the delivery envelope over the signature of the bidder or the bidder's "authorized representative". In revising the bid in this manner, the bidder must only write the amount of the change in price on the envelope **and must not reveal the bid price.**

c. Written communications, signed by the bidder or its "authorized representative", to revise bids will be accepted if received by the Architect prior to the time set for opening bids. The Architect will record the instructed revision upon opening the bid. Such written communication may be by facsimile if so stipulated in Supplemental Instructions to Bidders. In revising the bid in this manner, the bidder must only write the amount of the change in price **and must not reveal the bid price.**

d. Except as provided in Article 12 of these Instructions to Bidders, no bid shall be withdrawn, modified, or corrected after the time set for opening bids.

10. OPENING of BIDS:

Bids will be opened and read publicly at the time and place indicated in the Advertisement for Bids. Bidders or their authorized representatives are invited to be present.

11. INCOMPLETE and IRREGULAR BIDS:

A bid that is not accompanied by data required by the Bid Documents, or a bid which is in any way incomplete, may be rejected. Any bid which contains any uninitialed alterations or erasures, or any bid which contains any additions, alternate bids, or conditions not called for, or any other irregularities of any kind, will be subject to rejection.

12. BID ERRORS:

a. Errors and Discrepancies in the Proposal Form. In case of error in the extension of prices in bids, the unit price will govern. In case of discrepancy between the prices shown in the figures and in words, the words will govern.

b. Mistakes within the Bid. If the low bidder discovers a mistake in its bid, the low bidder may seek withdrawal of its bid without forfeiture of its bid guaranty under the following conditions:

(1) <u>**Timely Notice:**</u> The low bidder must notify the Awarding Authority and Architect in writing, within three working days after the opening of bids, that a mistake was made. This notice must be given within this time frame whether or not award has been made.

(2) <u>Substantial Mistake</u>: The mistake must be of such significance as to render the bid price substantially out of proportion to the other bid prices.

(3) <u>Type of Mistake</u>: The mistake must be due to calculation or clerical error, an inadvertent omission, or a typographical error which results in an erroneous sum. A mistake of law, judgment, or opinion shall not constitute a valid ground for withdrawal without forfeiture.

(4) **<u>Documentary Evidence</u>**: Clear and convincing documentary evidence of the mistake must be presented to the Awarding Authority and the Architect as soon as possible, but no later than three working days after the opening of bids.

The Awarding Authority's decision regarding a low bidder's request to withdraw its bid without penalty shall be made within 10 days after receipt of the bidder's evidence or by the next regular meeting of the Awarding Authority. Upon withdrawal of bid without penalty, the low bidder shall be prohibited from (1) doing work on the project as a subcontractor or in any other capacity and (2) bidding on the same project if it is re-bid.

13. DISQUALIFICATION of BIDDERS:

Any bidder(s) may be disqualified from consideration for contract award for the following reasons:

a. Collusion. Any agreement or collusion among bidders or prospective bidders in restraint of freedom of competition to bid at a fixed price or to refrain from bidding or otherwise shall render the bids void and shall cause the bidders or prospective bidders participating in such agreement or collusion to be disqualified from submitting further bids to the Awarding Authority on future lettings. (See § 39-2-6, Code of Alabama 1975, for possible criminal sanctions.)

b. Advance Disclosure. Any disclosure in advance of the terms of a bid submitted in response to an Advertisement for Bids shall render the proceedings void and require readvertisement and rebid.

c. Failure to Settle Other Contracts. The Awarding Authority may reject a bid from a bidder who has not paid, or satisfactorily settled, all bills due for labor and material on other contracts in force at the time of letting.

14. CONSIDERATION of BIDS:

a. After the bids are opened and read publicly, the bid prices will be compared and the results of this comparison will be available to the public. Until the final award of the contract, however, the Awarding Authority shall have the right to reject any or all bids, and it shall have the right to waive technical errors and irregularities if, in its judgment, the bidder will not have obtained a competitive advantage and the best interests of the Awarding Authority will be promoted.

b. If the Bid Documents request bids for projects or parts of projects in combination or separately, the Bid Documents must include modifications of, or supplements to, these Instructions to Bidders setting forth applicable bid procedures. Award or awards will be made to the lowest responsible and responsive bidder or bidders in accordance with such bid procedures.

15. DETERMINATION of LOW BIDDER by USE of ALTERNATES:

a. The Awarding Authority may request alternate bid prices (alternates) to facilitate either reducing the base bid to an amount within the funds available for the project or adding items to the base bid within the funds available for the project. Alternates, if any, are listed in the Proposal Form in the order in which they shall cumulatively deduct from or add to the base bid for determining the lowest bidder.

b. If alternates are included in the Proposal Form, the Awarding Authority shall determine the dollar amount of funds available and immediately prior to the opening of bids shall announce publicly the funds available for the project. The dollar amount of such funds shall be used to determine the lowest bidder as provided herein below, notwithstanding that the actual funds available for the project may subsequently be determined to be more or less than the expected funds available as determined immediately prior to the time of the opening of bids.

c. If the base bid of the lowest bidder exceeds the funds available and alternate bid prices will reduce the base bids to an amount that is within the funds available, the lowest bidder will be determined by considering, in order, the fewest number of the alternates that produces a price within the funds available. If the base bid of the lowest bidder is within the funds available and alternate bid prices will permit adding items to the base bid, the lowest bidder will be determined by considering, in order, the greatest number of the alternates that produces a price within the funds available.

d. After the lowest bidder has been determined as set forth above, the Awarding Authority may award that bidder any combination of alternates, provided said bidder is also the low bidder when only the Base Bid and such combination of alternates are considered.

16. UNIT PRICES:

a. Work Bid on a Unit Price Basis. Where all, or part(s), of the planned Work is bid on a unit price basis, both the unit prices and the extensions of the unit prices constitute a basis of determining the lowest responsible and responsive bidder. In cases of error in the extension of prices of bids, the unit price will govern. A bid may be rejected if any of the unit prices are obviously unbalanced or non-competitive.

b. Unit Prices for Application to Change Orders. As a means of predetermining unit costs for changes in certain elements of the Work, the Bid Documents may require that the bidders furnish unit prices for those items in the Proposal Form. Unit prices for application to changes in the work are not a basis for determining the lowest bidder. Non-competitive unit prices proposed by the successful bidder may be rejected and competitive prices negotiated by the Awarding Authority prior to contract award. Unit prices for application to changes in the work are not effective unless specifically included and agreed upon in the Construction Contract.

17. AWARD of CONTRACT:

a. The contract shall be awarded to the lowest responsible and responsive bidder unless the Awarding Authority finds that all the bids are unreasonable or that it is not in the best interest of the Awarding Authority to accept any of the bids. A responsible bidder is one who, among other qualities determined necessary for performance, is competent, experienced, and financially able to perform the contract. A responsive bidder is one who submits a bid that complies with the terms and conditions of the Advertisement for Bids and the Bid Documents. Minor irregularities in the bid shall not defeat responsiveness.

b. A bidder to whom award is made will be notified by telegram, confirmed facsimile, or letter to the address shown on the Proposal Form at the earliest possible date. Unless other time frames are stipulated in Supplemental Instructions to Bidders, the maximum time frames allowed for each step of the process between the opening of bids and the issuance of an order to

proceed with the work shall be as follows:

(1)	Award of contract by Awarding Authority	30 calendar days after the opening of bids
(2)	Contractor's return of the fully executed contract, with bonds and evidence of insurance, to the Awarding Authority	15 calendar days after the contract has been presented to the contractor for signature (from the Lead Design Professional)
(3)	Awarding Authority's approval of the contractor's bonds and evidence of insurance and completion of contract execution	20 calendar days after the contractor presents complete and acceptable documents to the Architect
(4)	Notice To Proceed issued to the contractor along with distribution of the fully executed construction contract to all parties.	15 calendar days after final execution of contract by the Awarding Authority, by various State Agencies if required and by the Governor if his or her signature on the contract is required by law

The time frames stated above, or as otherwise specified in the Bid Documents, may be extended by written agreement between the parties. Failure by the Awarding Authority to comply with the time frames stated above or stipulated in Supplemental Instructions to Bidders, or agreed extensions thereof, shall be just cause for the withdrawal of the contractor's bid and contract without forfeiture of bid security.

c. Should the successful bidder or bidders to whom the contract is awarded fail to execute the Construction Contract and furnish acceptable Performance and Payment Bonds and satisfactory evidence of insurance within the specified period, the Awarding Authority shall retain from the bid guaranty, if it is a cashier's check, or recover from the principal or the sureties, if the guaranty is a bid bond, the difference between the amount of the contract as awarded and the amount of the bid of the next lowest responsible and responsive bidder, but not more than \$10,000. If no other bids are received, the full amount of the bid guaranty shall be so retained or recovered as liquidated damages for such default. Any sums so retained or recovered shall be the property of the Awarding Authority.

d. All bid guaranties, except those of the three lowest bona fide bidders, will be returned immediately after bids have been checked, tabulated, and the relation of the bids established. The bid guaranties of the three lowest bidders will be returned as soon as the contract bonds and the contract of the successful bidder have been properly executed and approved. When the award is deferred for a period of time longer than 15 days after the opening of the bids, all bid guaranties, except those of the potentially successful bidders, shall be returned. If no award is made within the specified period, as it may by agreement be extended, all bids will be rejected, and all guaranties returned. If any potentially successful bidder agrees in writing to a stipulated extension in time for consideration of its bid and its bid was guaranteed with a cashier's check, the Awarding Authority may permit the potentially successful bidder to substitute a satisfactory bid bond for the cashier's check.

END of INSTRUCTIONS TO BIDDERS

002213 - SUPPLEMENTARY FORMS AND INSTRUCTIONS

PART 1 - GENERAL

- 1.1 This section includes the following:
 - A. Alabama Department of Revenue Notice for Tax Guidance and bulletin from State of Alabama Building Commission.
 - B. Application for Sales and Use Tax Certificate of Exemption with instructions.
 - C. Accounting of Sales Tax Form.
 - D. DCM Form C-6 Performance Bond.
 - E. DCM Form C-7 Payment Bond.
- PART 2 PRODUCTS (Not Used)

PART 3 – EXECUTION

- 3.1 SALES TAX
 - A. The Solid Waste Disposal Authority is a State sales tax exempt entity, and will exercise that status for the construction of this project.
 - B. Accounting of Sales Tax form should be attached to proposal submitted for this project.

3.2 PERFORMANCE BOND AND PAYMENT BOND

- A. Bond Requirements: Both a Performance Bond and a Payment Bond will be required, each in an amount equal to 100 percent of the Contract Sum.
- B. Time of Delivery and Form of Bonds: The Proposer shall deliver the required bonds to Owner no later than 10 days after the date of Notice of Intent to Award and no later than the date of execution of the Contract, whichever occurs first. Owner may deem the failure of the Bidder to deliver required bonds within the period of time allowed a default.

3.3 ADVERSE WEATHER DELAY

A. Extensions of time due to weather delays will only be granted for adverse weather beyond anticipated weather delays shown below. Monthly Anticipated Adverse Weather Delays.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
11	8	6	4	4	5	6	4	4	3	4	8

- B. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the Contractor's scheduled work day. If the number of actual adverse weather days exceeds the number of days anticipated in chart above, the Architect will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days.
- C. Days must be applied for thru a change order proposal within the following month of occurring.

END OF DOCUMENT 002213

DCM Form C-3 (must be submitted with DCM Form C-3A) January 2020

PROPOSAL FORM

То:		Dat	te:
(Awarding Authority)			
In compliance with the Advertisement for Bids and su	bject to a	all the conditions thereo	f, the undersigned
(Legal Name of	of Bidder)		
hereby proposes to furnish all labor and materials and	perform	all work required for th	e construction of
WORK			
in accordance with Drawings and Specifications, dated			prepared by
			Architect/Engineer.
The Bidder, which is organized and existing under the	laws of t	the State of	
having its principal offices in the City of			
is: \Box a Corporation \Box a Partnership \Box an Indi	ividual	(other)	;
BIDDER'S REPRESENTATION: The Bidder dechaving become fully informed regarding all pertinent and Specifications (including all Addenda received Documents relative thereto, and that it has satisfied itse ADDENDA: The Bidder acknowledges receipt of Add	clares that conditio) for the elf relativ	at it has examined the ns, and that it has exam we work and the other ve to the Work to be per os through	site of the Work, nined the Drawings Bid and Contract rformed.
BASE BID : For construction complete as shown and s	pacified	the sum of	
DASE DID . For construction complete as shown and s		Dollars (\$)
ALTERNATES: If alternates as set forth in the Bid I are to be made to the Base Bid:	Documen	nts are accepted, the fol	lowing adjustments
For Alternate No. 1 () (Insert key word for Alternate)	(add)	(deduct) \$	
For Alternate No. 2 ((add)	(deduct) \$	
For Alternate No. 3 ((add)	(deduct) \$	
For Alternate No. 4 ()	(add)	(deduct) \$	
For Alternate No. 5 ()	(add)	(deduct) \$	
For Alternate No. 6 ()	(add)	(deduct) \$	

UNIT PRICES - (See Attachment)

BID SECURITY: The undersigned agrees to enter into a Construction Contract and furnish the prescribed Performance and Payment Bonds and evidence of insurance within fifteen calendar days, or such other period stated in the Bid Documents, after the contract forms have been presented for signature, provided such presentation is made within 30 calendar days after the opening of bids, or such other period stated in the Bid Documents. As security for this condition, the undersigned further agrees that the funds represented by the Bid Bond (or cashier's check) attached hereto may be called and paid into the account of the Awarding Authority as liquidated damages for failure to so comply.

Attached hereto is a: (Mark the appropriate box and provide the applicable information.)

□ Bid Bond, executed by		as Surety,
□ a cashier's check on the	Bank of	,
for the sum of		
Dollars (\$) made payable to the Awarding Authority.	

BIDDER'S ALABAMA LICENSE:

State License for General Contracting:

License Number Bid Limit

imit Type(s) of Work

CERTIFICATIONS: The undersigned certifies that he or she is authorized to execute contracts on behalf of the Bidder as legally named, that this proposal is submitted in good faith without fraud or collusion with any other bidder, that the information indicated in this document is true and complete, and that the bid is made in full accord with State law. Notice of acceptance may be sent to the undersigned at the address set forth below.

The Bidder also declares that a list of all proposed major subcontractors and suppliers will be submitted at a time subsequent to the receipt of bids as established by the Architect in the Bid Documents but in no event shall this time exceed twenty-four (24) hours after receipt of bids.

Legal Name of Bidder	
Mailing Address	
* By (Legal Signature)	
* Name (type or print)	(Seal)
* Title	
Telephone Number	

* If other than the individual proprietor, or an above named member of the Partnership, or the above named president, vice-president, or secretary of the Corporation, attach written authority to bind the Bidder. Any modification to a bid shall be over the initials of the person signing the bid, or of an authorized representative.

Note: A completed DCM Form C-3A: Accounting of Sales Tax must be submitted with DCM Form C-3: Proposal Form. Submission of DCM Form C-3A is required, it is not optional. A proposal shall be rendered non-responsive if an Accounting of Sales Tax is not provided.

ESTIMATED SALES TAX AMOUNT

ACCOUNTING OF SALES TAX Attachment to DCM Form C-3: Proposal Form

То:		Date:	
	(Awarding Authority)		
NAME OF PROJECT			

SALES TAX ACCOUNTING

Pursuant to Act 2013-205, Section 1(g) the Contractor accounts for the sales tax NOT included in the bid proposal form as follows:

BASE BID:		\$
Alternate No. 1 () (Insert key word for Alternate)	(add)	(deduct) \$
Alternate No. 2 ()	(add)	(deduct) \$
Alternate No. 3 ()	(add)	(deduct) \$
Alternate No. 4 ()	(add)	(deduct) \$
Alternate No. 5 ()	(add)	(deduct) \$
Alternate No. 6 ()	(add)	(deduct) \$

Failure to provide an accounting of sales tax shall render the bid non-responsive. Other than determining responsiveness, sales tax accounting shall not affect the bid pricing nor be considered in the determination of the lowest responsible and responsive bidder.

Legal Name of Bidder	
Mailing Address	
*By (Legal Signature)	
*Name (type or print)	(Seal)
*Title	
Telephone Number	
Email Address	

Note: A completed DCM Form C-3A: Accounting of Sales Tax must be submitted with DCM Form C-3: Proposal Form. Submission of DCM Form C-3A with DCM Form C-3 is required, it is not optional. A proposal shall be rendered non-responsive if an Accounting of Sales Tax is not provided.

STATEMENT OF COMPLIANCE

with

Act No. 2016-312

"In compliance with Act 2016-312, the contractor hereby certifies that it is not currently engaged in, and will not engage in, the boycott of a person or an entity based in or doing business with a jurisdiction with which this state can enjoy open trade."

Ву_____

Signature of Officer of the Company

Date

Name and Title

Company Name



State of Alabama

Disclosure Statement

Required by Article 3B of Title 41, Code of Alabama 1975

ENTITY COMPLETING FORM
ADDRESS
CITY, STATE, ZIP TELEPHONE NUMBER
STATE AGENCY/DEPARTMENT THAT WILL RECEIVE GOODS, SERVICES, OR IS RESPONSIBLE FOR GRANT AWARD
ADDRESS
CITY, STATE, ZIP TELEPHONE NUMBER
This form is provided with:
Have you or any of your partners, divisions, or any related business units previously performed work or provided goods to any State Agency/Department in the current or last fiscal year? Yes No If yes, identify below the State Agency/Department that received the goods or services, the type(s) of goods or services previously provided, and the amount received for the provision of such goods or services. STATE AGENCY/DEPARTMENT TYPE OF GOODS/SERVICES AMOUNT RECEIVED
Have you or any of your partners, divisions, or any related business units previously applied and received any grants from any State Agency/Department in the current or last fiscal year? Yes No If yes, identify the State Agency/Department that awarded the grant, the date such grant was awarded, and the amount of the grant.
STATE AGENCY/DEPARTMENT DATE GRANT AWARDED AMOUNT OF GRANT
 List below the name(s) and address(es) of all public officials/public employees with whom you, members of your immediate family, or any of your employees have a family relationship and who may directly personally benefit financially from the proposed transaction Identify the State Department/Agency for which the public officials/public employees work. (Attach additional sheets if necessary.) NAME OF PUBLIC OFFICIAL/EMPLOYEE ADDRESS STATE DEPARTMENT/AGENCY

2. List below the name(s) and address(es) of all family members of public officials/public employees with whom you, members of your immediate family, or any of your employees have a family relationship and who may directly personally benefit financially from the proposed transaction. Identify the public officials/public employees and State Department/Agency for which the public officials/public employees work. (Attach additional sheets if necessary.)

ADDRESS

NAME OF FAMILY MEMBER NAME OF PUBLIC OFFICIAL/ PUBLIC EMPLOYEE STATE DEPARTMENT/ AGENCY WHERE EMPLOYED

If you identified individuals in items one and/or two above, describe in detail below the direct financial benefit to be gained by the public officials, public employees, and/or their family members as the result of the contract, proposal, request for proposal, invitation to bid, or grant proposal. (Attach additional sheets if necessary.)

Describe in detail below any indirect financial benefits to be gained by any public official, public employee, and/or family members of the public official or public employee as the result of the contract, proposal, request for proposal, invitation to bid, or grant proposal. (Attach additional sheets if necessary.)

List below the name(s) and address(es) of all paid consultants and/or lobbyists utilized to obtain the contract, proposal, request for proposal, invitation to bid, or grant proposal:

ADDRESS

NAME OF PAID CONSULTANT/LOBBYIST

By signing below, I certify under oath and penalty of perjury that all statements on or attached to this form are true and correct to the best of my knowledge. I further understand that a civil penalty of ten percent (10%) of the amount of the transaction, not to exceed \$10,000.00, is applied for knowingly providing incorrect or misleading information.

Signature	Date	
Notary's Signature	Date	Date Notary Expires
Article 3B of Title 41, Code of Alabama 1 contracts, or grant proposals to the State	975 requires the disclosure statement to be co of Alabama in excess of \$5,000.	ompleted and filed with all proposals, bids,

USE BLACK INK ONLY

BID BOND

The **PRINCIPAL** (*Bidder's Name and Address*) Name: Address:

The **SURETY** (*Name and Principal Place of Business*) Name: Address:

The **OWNER** (*Name and Address*) Name: Address:

The **PROJECT** for which the Principal's Bid is submitted: (*Project name as it appears in the Bid Documents*)

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned Principal and Surety, jointly and severally, hereby bind ourselves, our heirs, executors, administrators, successors, and assigns to the Owner in the **PENAL SUM of five percent (5%) of the amount of the Principal's bid, but in no event more than Ten-thousand Dollars (\$10,000.00**).

THE CONDITION OF THIS OBLIGATION is that the Principal has submitted to the Owner the attached bid, which is incorporated herein by reference, for the Project identified above.

NOW, THEREFORE, if, within the terms of the Bid Documents, the Owner accepts the Principal's bid and the Principal thereafter either:

- (a) executes and delivers a Construction Contract with the required Performance and Payment Bonds (each in the form contained in the Bid Documents and properly completed in accordance with the bid) and delivers evidence of insurance as prescribed in the Bid Documents, or
- (b) fails to execute and deliver such Construction Contract with such Bonds and evidence of insurance, but pays the Owner the difference, not to exceed the Penal Sum of this Bond, between the amount of the Principal's Bid and the larger amount for which the Owner may award a Construction Contract for the same Work to another bidder,
 then this obligation shall be null and word, otherwise it shall remain in full force and effect

then, this obligation shall be null and void, otherwise it shall remain in full force and effect.

The Surety, for value received, hereby stipulates and agrees that the obligation of the Surety under this Bond shall not in any manner be impaired or affected by any extension of the time within which the Owner may accept the Principal's bid, and the Surety does hereby waive notice of any such extension.

SIGNED AND SEALED this	day of	
ATTEST:		PRINCIPAL:
		By
		Name and Title SURETY:
ATTEST		
		By

Name and Title

DOCUMENT 004321 - ALLOWANCE FORM

1.1 BID INFORMATION

- A. Bidder: _____
- B. Project Name: Alabama A&M University Knight Complex Cafeteria Renovation.
- C. Project Location: Huntsville, Alabama.
- D. Owner: Alabama A&M University.
- E. Architect: Fuqua & Partners Architects.
- F. Architect Project Number: 02419.

1.2 BID FORM SUPPLEMENT

- A. This form is required to be attached to the Bid Form.
- B. The undersigned Bidder certifies that Base Bid submission to which this Bid Supplement is attached includes those allowances described in the Contract Documents and scheduled in Section 012100 "Allowances."

1.3 SUBMISSION OF BID SUPPLEMENT

- A. Respectfully submitted this ____ day of _____, 2020.
- B. Submitted By:______(Insert name of bidding firm or corporation).
- C. Authorized Signature:______(Handwritten signature).
- D. Signed By:_____(Type or print name).
- E. Title: _____(Owner/Partner/President/Vice President).

END OF DOCUMENT 004321

DOCUMENT 004322 - UNIT PRICES FORM

1.1 BID INFORMATION

- A. Bidder:
- B. Project Name: Alabama A&M University Knight Complex Cafeteria Renovation.
- C. Project Location: Normal, Alabama.
- D. Owner: Alabama A&M University.
- E. Architect: Fuqua & Partners Architects.
- F. Architect Project Number: 02419.

1.2 BID FORM SUPPLEMENT

- A. This form is required to be attached to the Bid Form.
- B. The undersigned Bidder proposes the amounts below be added to or deducted from the Contract Sum on performance and measurement of the individual items of Work and for adjustment of the quantity given in the Unit-Price Allowance for the actual measurement of individual items of the Work.
- C. If the unit price does not affect the Work of this Contract, the Bidder shall indicate "NOT APPLICABLE."

1.3 UNIT PRICES

- C. Unit Price No. 3: 1. ______ dollars (\$_____) per unit.

1.4	SUBMISSION OF BID SUPPLEM	MENT	
А.	Respectfully submitted this	_day of	, 2020.
В.	Submitted By: corporation).		(Insert name of bidding firm or
C.	Authorized Signature:		(Handwritten signature).
D.	Signed By:		(Type or print name).
E.	Title:		(Owner/Partner/President/Vice President).

END OF DOCUMENT 004322

(1)	(1) DCM (BC)	Project No.
	Do not staple th single-sided; do	is form and/or attachments; use clips. Print not submit double-side printed documents.
	CONSTRUCTION CONTRACT	
(2) (3)	 (2) This Construction Contract is entered into this day of (3) between the OWNER(s), Entity Name(s): Address(es): 	in the year of
(4)	(4) and the CONTRACTOR , Company Name: Address:	
(5)	(5) for the WORK of the Project, identified as:	
(6) (7)	 (6) The CONTRACT DOCUMENTS are dated (7) ADDENDA 	and have been amended by
(8)	(8) The ARCHITECT is	
(9) (10)	The CONTRACT SUM is Dollars (\$) and is the sum of the Contractor's Base Bid for the Work and the following BID ALTERNATE PRICES:	

(11) The CONTRACT TIME is

Numbers in margin correspond to "Checklist", DCM Form B-7

() calendar days.

THE OWNER AND THE CONTRACTOR AGREE AS FOLLOWS:

The Contract Documents, as defined in the General Conditions of the Contract (DCM Form C-8), are incorporated herein by reference. The Contractor shall perform the Work in accordance with the Contract Documents. The Owner will pay and the Contractor will accept as full compensation for such performance of the Work, the Contract Sum subject to additions and deductions (including liquidated damages) as provided in the Contract Documents. The Work shall be commenced on a date to be specified in a Notice to Proceed issued by the Owner or the Director, Alabama Division of Construction Management, and shall then be substantially completed within the Contract Time.

(12) LIQUIDATED DAMAGES for which the Contractor and its Surety (if any) shall be liable and may be required to pay the Owner in accordance with the Contract Documents shall be equal to six percent interest per annum on the total Contract Sum unless a dollar amount is stipulated in the following space, in which case liquidated damages shall be determined at ______ dollars (\$_____) per calendar day.

Page 1 of 2

(14) **STATE GENERAL CONTRACTOR'S LICENSE**: The Contractor does hereby certify that Contractor is currently licensed by the Alabama State Licensing Board for General Contractors and that the certificate for such license bears the following:

Bid Limit:

License No.

The Owner and Contractor have entered into this Construction Contract as of the date first written above and have executed this Construction Contract in sufficient counterparts to enable each contracting party to have an originally executed Construction Contract each of which shall, without proof or accounting for the other counterparts, be deemed an original thereof.

Classification:

The Owner does hereby certify that this Construction Contract was let in accordance with the provisions of Title 39, Code of Alabama 1975, as amended, and all other applicable provisions of law, and that the terms and commitments of this Construction Contract do not constitute a debt of the State of Alabama in violation of Article 11, Section 213 of the Constitution of Alabama, 1901, as amended by Amendment Number 26.

(15)	APPROVALS	CONTRACTING PARTIES
	By Governor (all State projects)	Contractor Company
	By Secretary of State (Conservation projects only)	BySignature Name & Title
	By Agency, Title: ALABAMA DEPARTMENT OF FINANCE, REAL PROPERTY MANAGEMENT (RPM), DIVISION OF CONSTRUCTION MANAGEMENT (DCM)	Owner Entity By Signature
	By Finance Director (Finance & ABRFA projects only) By	Name & Title
	By DCM Director (all State Agencies projects)	BySignature
	Recommended By DCM Contract Administrator (all State Agencies projects)	Name & Title The Awarding Authority/Owner certifies that funds are available in the amount required for the Owner-Architect Agreement.

Signature/review flow: Contractor > Architect/Engineer (review only) > Owner > RPM/DCM > Finance-Legal (review and stamp only) (> Finance, Finance sub-Agencies & Alabama Building Renovation Finance Authority [ABRFA] projects then go to Finance Director) > Governor (> Conservation projects then go to Secretary of State). Following the Governor's signature or for Conservation projects the Secretary of State's signature, the document returns to DCM which distributes the fully executed Contract to all parties along with a Notice to Proceed. Note: Transportation inserts an additional signature sheet.

(1)	PERFORMANCE BOND	SURETY'S BOND NUMBER
(2)	The PRINCIPAL (<i>Name and address of Contractor as appear in the Construe</i> Name: Address:	ction Contract)
(3)	The SURETY (<i>Name and Principal Place of Business</i>) Name: Address:	
(4)	The OWNER (Name and address, same as appears in the Construction Contra Name: Address:	act)
(5)	The PENAL SUM of this Bond (the Contract Sum)	Dollars (\$).
(6)	DATE of the Construction Contract :	
(7)	The PROJECT : (Same as appears in the Construction Contract)	
	1. WE, THE PRINCIPAL (hereinafter "Contractor") AND THE hereby bind ourselves, our heirs, executors, administrators, succ the Penal Sum stated above for the performance of the Contract accord with the requirements of the Contract Documents, which a If the Contractor performs the Contract, and Contract Chang Contract Documents, then this obligation shall be null and voi force and effect.	E SURETY , jointly and severally, essors, and assigns to the Owner in ct, and Contract Change Orders, in are incorporated herein by reference. ge Orders, in accordance with the d; otherwise it shall remain in full
	2. The Penal Sum shall remain equal to the Contract Sum as the C Change Orders. All Contract Change Orders involving an increa consent of Surety by endorsement of the Contract Change notification of any Contract Change Orders involving only extens	ontract Sum is adjusted by Contract ase in the Contract Sum will require Order form. The Surety waives sion of the Contract Time.

Page 1 of 3

- 3. Whenever the Architect gives the Contractor and the Surety, at their addresses stated above, a written Notice to Cure a condition for which the Contract may be terminated in accordance with the Contract Documents, the Surety may, within the time stated in the notice, cure or provide the Architect with written verification that satisfactory positive action is in process to cure the condition.
- 4. The Surety's obligation under this Bond becomes effective after the Contractor fails to satisfy a Notice to Cure and the Owner:
 - (a) gives the Contractor and the Surety, at their addresses stated above, a written Notice of Termination declaring the Contractor to be in default under the Contract and stating that the Contractor's right to complete the Work, or a designated portion of the Work, shall terminate seven days after the Contractor's receipt of the notice; and
 - (b) gives the Surety a written demand that, upon the effective date of the Notice of Termination, the Surety promptly fulfill its obligation under this Bond.
- 5. In the presence of the conditions described in Paragraph 4, the Surety shall, at its expense:
 - (a) On the effective date of the Notice of Termination, take charge of the Work and be responsible for the safety, security, and protection of the Work, including materials and equipment stored on and off the Project site, and
 - (b) Within twenty-one days after the effective date of the Notice of Termination, proceed, or provide the Owner with written verification that satisfactory positive action is in process to facilitate proceeding promptly, to complete the Work in accordance with the Contract Documents, either with the Surety's resources or through a contract between the Surety and a qualified contractor to whom the Owner has no reasonable objection.
- 6. As conditions precedent to taking charge of and completing the Work pursuant to Paragraph 5, the Surety shall neither require, nor be entitled to, any agreements or conditions other than those of this Bond and the Contract Documents. In taking charge of and completing the Work, the Surety shall assume all rights and obligations of the Contractor under the Contract Documents; however, the Surety shall also have the right to assert "Surety Claims" to the Owner in accordance with the Contract Documents. The presence or possibility of a Surety Claim shall not be just cause for the Surety to fail or refuse to promptly take charge of and complete the Work or for the Owner to fail or refuse to continue to make payments in accordance with the Contract Documents.
- **7.** By accepting this Bond as a condition of executing the Construction Contract, and by taking the actions described in Paragraph 4, the Owner agrees that:
 - (a) the Owner shall promptly advise the Surety of the unpaid balance of the Contract Sum and, upon request, shall make available or furnish to the Surety, at the cost of reproduction, any portions of the Project Record, and
 - (b) as the Surety completes the Work, or has it completed by a qualified contractor, the Owner shall pay the Surety, in accordance with terms of payment of the Contract Documents, the unpaid balance of the Contract Sum, less any amounts that may be or become due the Owner from the Contractor under the Construction Contract or from the Contractor or the Surety under this Bond.
- 8. In the presence of the conditions described in Paragraph 4, the Surety's obligation includes responsibility for the correction of Defective Work, liquidated damages, and reimbursement of any reasonable expenses incurred by the Owner as a result of the Contractor's default under the Contract, including architectural, engineering, administrative, and legal services.

- **9.** Nothing contained in this Bond shall be construed to mean that the Surety shall be liable to the Owner for an amount exceeding the Penal Sum of this Bond, except in the event that the Surety should be in default under the Bond by failing or refusing to take charge of and complete the Work pursuant to Paragraph 5. If the Surety should fail or refuse to take charge of and complete the Work, the Owner shall have the authority to take charge of and complete the Work, or have it completed, and the following costs to the Owner, less the unpaid balance of the Contract Sum, shall be recoverable under this Bond:
 - (a) the cost of completing the Contractor's responsibilities under the Contract, including correction of Defective Work;
 - (b) additional architectural, engineering, managerial, and administrative services, and reasonable attorneys' fees incident to completing the Work;
 - (c) interest on, and the cost of obtaining, funds to supplement the unpaid balance of the Contract Sum as may be necessary to cover the foregoing costs;
 - (d) the fair market value of any reductions in the scope of the Work necessitated by insufficiency of the unpaid balance of the Contract Sum and available supplemental funds to cover the foregoing costs; and
 - (f) additional architectural, engineering, managerial, and administrative services, and reasonable attorneys' fees incident to ascertaining and collecting the Owner's losses under the Bond.
- **10.** All claims and disputes arising out of or related to this bond, or its breach, shall be resolved in accordance with Article 24, General Conditions of the Contract.

(8)	SIGNED AND SEALED this	day of
& 10)	SURETY:	CONTRACTOR as PRINCIPAL:
	By	By
	Name and Title	Name and Title

(11 & 12) NOTE: Original power of attorney for the Surety's signatory shall be furnished with each of the original six bond forms to be attached to each of the six contract forms per project. Do not use staples; use clips.

(9

(1)	PAYMENT BOND	SURETY'S BOND NUMBER
(2)	The PRINCIPAL (<i>Name and address of Contractor, same as appears in the C</i> Name: Address:	Construction Contract)
(3)	The SURETY (<i>Name and Principal Place of Business</i>) Name: Address:	
(4)	The OWNER(s) (<i>Name and address, same as appears in the Construction Con</i> Name: Address:	ntract)
(5)	The PENAL SUM of this Bond (the Contract Sum)	ollars (\$).
(6)	DATE of the Construction Contract:	
(7)	The PROJECT : (Same as appears in the Construction Contract)	
	1. WE, THE PRINCIPAL (hereinafter "Contractor") AND THE SURETY, jointly and severally, hereby bind ourselves, our heirs, executors, administrators, successors, and assigns to the Owner in the Penal Sum stated above to promptly pay all persons supplying labor, materials, or supplies for or in the prosecution of the Contract, which is incorporated herein by reference, and any modifications thereof by Contract Change Orders. If the Contractor and its Subcontractors promptly pay all persons supplying labor, materials, or supplies for or in the prosecution of the Contract Change Orders. If the Contractor and its Contract and Contract Change Orders, then this obligation shall be null and void; otherwise to remain and be in full force and effect.	
	2. The Penal Sum shall remain equal to the Contract Sum as the Contract Sum is adjusted by Contrac Change Orders. All Contract Change Orders involving an increase in the Contract Sum will requir consent of Surety by endorsement of the Contract Change Order form. The Surety waive notification of any Contract Change Orders involving only extension of the Contract Time.	

Numbers in margin correspond to "Checklist", DCM Form B-7

- 3. Any person that has furnished labor, materials, or supplies for or in the prosecution of the Contract and Contract Change Orders for which payment has not been timely made may institute a civil action upon this Bond and have their rights and claims adjudicated in a civil action and judgment entered thereon. Notwithstanding the foregoing, a civil action may not be instituted on this bond until 45 days after written notice to the Surety of the amount claimed to be due and the nature of the claim. The civil action must commence not later than one year from the date of final settlement of the Contract. The giving of notice by registered or certified mail, postage prepaid, addressed to the Surety at any of its places of business or offices shall be deemed sufficient. In the event the Surety or Contractor fails to pay the claim in full within 45 days from the mailing of the notice, then the person or persons may recover from the Contractor and Surety, in addition to the amount of the claim, a reasonable attorney's fee based on the result, together with interest on the claim from the date of the notice.
- 4. Every person having a right of action on this bond shall, upon written application to the Owner indicating that labor, material, or supplies for the Work have been supplied and that payment has not been made, be promptly furnished a certified copy of this bond and the Construction Contract. The claimant may bring a civil action in the claimant's name on this Bond against the Contractor and the Surety, or either of them, in the county in which the Work is to be or has been performed or in any other county where venue is otherwise allowed by law.
- **5.** This bond is furnished to comply with Code of Alabama, §39-1-1, and all provisions thereof shall be applicable to civil actions upon this bond.
- 6. All claims and disputes between Owner and either the Contractor or Surety arising out of or related to this bond, or its breach, shall be resolved in accordance with Article 24, General Conditions of the Contract.

(8)	SIGNED AND SEALED this day of,	
(9 & 10)	SURETY:	CONTRACTOR as PRINCIPAL:
	 By	By
	Name and Title	Name and Title
(11 & 12)	NOTE: Original power of attorney for the Surety's signatory attached to each of the six contract forms per project	shall be furnished with each of the original six bond forms to be . Do not use staples; use clips.

GENERAL CONDITIONS of the CONTRACT

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ARTICLE 1 DEFINITIONS

Whenever the following terms, or pronouns in place of them, are used in the Contract Documents, the intent and meaning shall be interpreted as follows:

- **A. ALABAMA DIVISION OF CONSTRUCTION MANAGEMENT:** The Technical Staff of the Alabama Division of Construction Management.
- **B. ARCHITECT:** The Architect is the person or entity lawfully licensed to practice architecture in the State of Alabama, who is under contract with the Owner as the primary design professional for the Project and identified as the Architect in the Construction Contract. The term "Architect" means the Architect or the Architect's authorized representative. If the employment of the Architect is terminated, the Owner shall employ a new Architect whose status under the Contract Documents shall be that of the former Architect. If the primary design professional for the Project is a Professional Engineer, the term "Engineer" shall be substituted for the term "Architect" wherever it appears in this document.

- **C. COMMISSION:** The former Alabama Building Commission, for which the Alabama Division of Construction Management has been designated by the Legislature as its successor.
- **D. CONTRACT:** The Contract is the embodiment of the Contract Documents. The Contract represents the entire and integrated agreement between the Owner and Contractor and supersedes any prior written or oral negotiations, representations or agreements that are not incorporated into the Contract Documents. The Contract may be amended only by a Contract Change Order or a Modification to the Construction Contract. The contractual relationship which the Contract creates between the Owner and the Contractor extends to no other persons or entities. The Contract consists of the following Contract Documents, including all additions, deletions, and modifications incorporated therein before the execution of the Construction Contract:
 - (1) Construction Contract
 - (2) Performance and Payment Bonds
 - (3) Conditions of the Contract (General, Supplemental, and other Conditions)
 - (4) Specifications
 - (5) Drawings
 - (6) Contract Change Orders
 - (7) Modifications to the Construction Contract (applicable to PSCA Projects)
- **E. CONTRACT SUM:** The Contract Sum is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents. The term "Contract Sum" means the Contract Sum stated in the Construction Contract as may have been increased or decreased by Change Order(s) in accordance with the Contract Documents.
- **F. CONTRACT TIME:** The Contract Time is the period of time in which the Contractor must achieve Substantial Completion of the Work. The date on which the Contract Time begins is specified in the written Notice To Proceed issued to the Contractor by the Owner or Director. The Date of Substantial Completion is the date established in accordance with Article 32. The term "Contract Time" means the Contract Time stated in the Construction Contract as may have been extended by Change Order(s) in accordance with the Contract Documents. The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.
- **G. CONTRACTOR:** The Contractor is the person or persons, firm, partnership, joint venture, association, corporation, cooperative, limited liability company, or other legal entity, identified as such in the Construction Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.
- H. DCM: The Alabama Division of Construction Management.
- I. DCM PROJECT INSPECTOR: The member of the Technical Staff of the Alabama Division of Construction Management to whom the Project is assigned relative to executing the respective inspections and authorities described in Article 16, Inspection of the Work.
- J. DEFECTIVE WORK: The term "Defective Work" shall apply to: (1) any product, material, system, equipment, or service, or its installation or performance, which does not conform to the requirements of the Contract Documents, (2) in-progress or completed Work the workmanship of which does not conform to the quality specified or, if not specified, to the quality produced by skilled workers performing work of a similar nature on similar projects in the state, (3) substitutions and deviations not properly submitted and approved or otherwise authorized, (4) temporary
supports, structures, or construction which will not produce the results required by the Contract Documents, and (5) materials or equipment rendered unsuitable for incorporation into the Work due to improper storage or protection.

- **K. DIRECTOR:** The Director of the Alabama Division of Construction Management.
- L. DRAWINGS: The Drawings are the portions of the Contract Documents showing graphically the design, location, layout, and dimensions of the Work, in the form of plans, elevations, sections, details, schedules, and diagrams.
- **M. NOTICE TO PROCEED:** A proceed order issued by the Owner or Director, as applicable, fixing the date on which the Contractor shall begin the prosecution of the Work, which is also the date on which the Contract Time shall begin.
- N. OWNER: The Owner is the entity or entities identified as such in the Construction Contract and is referred to throughout the Contract Documents as if singular in number. The term "Owner" means the Owner or the Owner's authorized representative. The term "Owner" as used herein shall be synonymous with the term "Awarding Authority" as defined and used in Title 39 Public Works, <u>Code of Alabama</u>, 1975, as amended.
- **O. THE PROJECT:** The Project is the total construction of which the Work required by these Contract Documents may be the entirety or only a part with other portions to be constructed by the Owner or separate contractors.
- **P. PROJECT MANUAL:** The Project Manual is the volume usually assembled for the Work which may include the Advertisement for Bids, Instructions to Bidders, sample forms, General Conditions of the Contract, Supplementary Conditions, and Specifications of the Work.
- **Q. SPECIFICATIONS:** The Specifications are that portion of the Contract Documents which set forth in writing the standards of quality and performance of products, equipment, materials, systems, and services and workmanship required for acceptable performance of the Work.
- **R. SUBCONTRACTOR:** A Subcontractor is a person or entity who is undertaking the performance of any part of the Work by virtue of a contract with the Contractor. The term "Subcontractor" means a Subcontractor or its authorized representatives.
- **S. THE WORK:** The Work is the construction and services required by the Contract Documents and includes all labor, materials, supplies, equipment, and other items and services as are necessary to produce the required construction and to fulfill the Contractor's obligations under the Contract. The Work may constitute the entire Project or only a portion of it.

ARTICLE 2 INTENT and INTERPRETATION of the CONTRACT DOCUMENTS

A. <u>INTENT</u>

It is the intent of the Contract Documents that the Contractor shall properly execute and complete the Work described by the Contract Documents, and unless otherwise provided in the Contract, the Contractor shall provide all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work, in full accordance with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

B. <u>COMPLEMENTARY DOCUMENTS</u>

The Contract Documents are complementary. If Work is required by one Contract Document, the Contractor shall perform the Work as if it were required by all of the Contract Documents. However, the Contractor shall be required to perform Work only to the extent that is consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

C. ORDER of PRECEDENCE

Should any discrepancy arise between the various elements of the Contract Documents, precedence shall be given to them in the following order unless to do so would contravene the apparent Intent of the Contract Documents stated in preceding Paragraph A:

- (1) The Construction Contract.
- (2) Addenda, with those of later date having precedence over those of earlier date.
- (3) Supplementary Conditions (or other Conditions which modify the General Conditions of the Contract).
- (4) General Conditions of the Contract.
- (5) The Specifications.
- (6) Details appearing on the Drawings; large scale details shall take precedence over smaller scale details.
- (7) The Drawings; large scale drawings shall take precedence over smaller scale drawings.

D. ORGANIZATION

Except as may be specifically stated within the technical specifications, neither the organization of the Specifications into divisions, sections, or otherwise, nor any arrangement of the Drawings shall control how the Contractor subcontracts portions of the Work or assigns Work to any trade.

E. <u>INTERPRETATION</u>

(1) The Contract Documents shall be interpreted collectively, each part complementing the others and consistent with the Intent of the Contract Documents stated in preceding Paragraph A. Unless an item shown or described in the Contract Documents is specifically identified to be furnished or installed by the Owner or others or is identified as "Not In Contract" ("N.I.C."), the Contractor's obligation relative to that item shall be interpreted to include furnishing, assembling, installing, finishing, and/or connecting the item at the Contractor's expense to produce a product or system that is complete, appropriately tested, and in operative condition ready for use or subsequent construction or operation of the Owner or separate contractors. The omission of words or phases for brevity of the Contract Documents, the inadvertent omission of words or phrases, or obvious typographical or written errors shall not defeat such interpretation as long as it is reasonably inferable from the Contract Documents as a whole.

(2) Words or phrases used in the Contract Documents which have well-known technical or

construction industry meanings are to be interpreted consistent with such recognized meanings unless otherwise indicated.

(3) Except as noted otherwise, references to standard specifications or publications of associations, bureaus, or organizations shall mean the latest edition of the referenced standard specification or publication as of the date of the Advertisement for Bids.

(4) In the case of inconsistency between Drawings and Specifications or within either document not clarified by addendum, the better quality or greater quantity of Work shall be provided in accordance with the Architect's interpretation.

(5) Any portions of the Contract Documents written in longhand must be initialed by all parties..

(6) Any doubt as to the meaning of the Contract Documents or any obscurity as to the wording of them, shall be promptly submitted in writing to the Architect for written interpretation, explanation, or clarification.

F. <u>SEVERABILITY</u>.

The partial or complete invalidity of any one or more provision of this Contract shall not affect the validity or continuing force and effect of any other provision.

ARTICLE 3 CONTRACTOR'S REPRESENTATIONS

By executing the Construction Contract the Contractor represents to the Owner:

- **A.** The Contractor has visited the site of the Work to become familiar with local conditions under which the Work is to be performed and to evaluate reasonably observable conditions as compared with requirements of the Contract Documents.
- **B.** The Contractor shall use its best skill and attention to perform the Work in an expeditious manner consistent with the Contract Documents.
- **C.** The Contractor is an independent contractor and in performance of the Contract remains and shall act as an independent contractor having no authority to represent or obligate the Owner in any manner unless authorized by the Owner in writing.

ARTICLE 4 DOCUMENTS FURNISHED to CONTRACTOR

Unless otherwise provided in the Contract Documents, twenty sets of Drawings and Project Manuals will be furnished to the Contractor by the Architect without charge. Other copies requested will be furnished at reproduction cost.

ARTICLE 5 OWNERSHIP of DRAWINGS

All original or duplicated Drawings, Specifications, and other documents prepared by the Architect, and furnished to the Contractor are the property of the Architect and are to be used solely for this Project and not to be used in any manner for other work. Upon completion of the Work, all copies of Drawings and Specifications, with the exception of the Contractor's record set, shall be returned or accounted for by the Contractor to the Architect, on request.

ARTICLE 6 SUPERVISION, SUPERINTENDENT, and EMPLOYEES

A. <u>SUPERVISION and CONSTRUCTION METHODS</u>

(1) The term "Construction Methods" means the construction means, methods, techniques, sequences, and procedures utilized by the Contractor in performing the Work. The Contractor is solely responsible for supervising and coordinating the performance of the Work, including the selection of Construction Methods, unless the Contract Documents give other specific instructions concerning these matters.

(2) The Contractor is solely and completely responsible for job site safety, including the protection of persons and property in accordance with Article 14.

(3) The Contractor shall be responsible to the Owner for acts and omissions of not only the Contractor and its agents and employees, but all persons and entities, and their agents and employees, who are performing portions of the Work for or on behalf of the Contractor or any of its Subcontractors.

(4) The Contractor shall be responsible to inspect the in-progress and completed Work to verify its compliance with the Contract Documents and to insure that any element or portion of the Work upon which subsequent Work is to be applied or performed is in proper condition to receive the subsequent Work.

B. <u>SUPERINTENDENT</u>

(1) The Contractor shall employ and maintain a competent level of supervision for the performance of the Work at the Project site, including a superintendent who shall:

(a) have full authority to receive instructions from the Architect or Owner and to act on those instructions and (b) be present at the Project site at all times during which Work is being performed.

(2) Before beginning performance of the Work, the Contractor shall notify the Architect in writing of the name and qualifications of its proposed superintendent so that the Owner may review the individual's qualifications. If, for reasonable cause, the Owner refuses to approve the individual, or withdraws its approval after once giving it, the Contractor shall name a different superintendent for the Owner's review and approval. Any disapproved superintendent will not perform in that capacity thereafter at the Project site.

C. <u>EMPLOYEES</u>

The Contractor shall permit only fit and skilled persons to perform the Work. The Contractor shall enforce safety procedures, strict discipline, and good order among persons performing the Work. The Contractor will remove from its employment on the Project any person who deliberately or persistently produces non-conforming Work or who fails or refuses to conform to reasonable rules of personal conduct contained in the Contract Documents or implemented by the Owner and delivered to the Contractor in writing during the course of the Work.

ARTICLE 7 REVIEW of CONTRACT DOCUMENTS and FIELD CONDITIONS by CONTRACTOR

- A. In order to facilitate assembly and installation of the Work in accordance with the Contract Documents, before starting each portion of the Work, the Contractor shall examine and compare the relevant Contract Documents, and compare them to relevant field measurements made by the Contractor and any conditions at the site affecting that portion of the Work.
- **B.** If the Contractor discovers any errors, omissions, or inconsistencies in the Contract Documents, the Contractor shall promptly report them to the Architect as a written request for information that includes a detailed statement identifying the specific Drawings or Specifications that are in need of clarification and the error, omission, or inconsistency discovered in them.

(1) The Contractor shall not be expected to act as a licensed design professional and ascertain whether the Contract Documents comply with applicable laws, statutes, ordinances, building codes, and rules and regulations, but the Contractor shall be obligated to promptly notify the Architect of any such noncompliance discovered by or made known to the Contractor. If the Contractor performs Work without fulfilling this notification obligation, the Contractor shall pay the resulting costs and damages that would have been avoided by such notification.

(2) The Contractor shall not be liable to the Owner for errors, omissions, or inconsistencies that may exist in the Contract Documents, or between the Contract Documents and conditions at the site, unless the Contractor knowingly fails to report a discovered error, omission, or inconsistency to the Architect, in which case the Contractor shall pay the resulting costs and damages that would have been avoided by such notification.

- **C.** If the Contractor considers the Architect's response to a request for information to constitute a change to the Contract Documents involving additional costs and/or time, the Contractor shall follow the procedures of Article 20, Claims for Extra Cost or Extra Work.
- **D.** If, with undue frequency, the Contractor requests information that is obtainable through reasonable examination and comparison of the Contract Documents, site conditions, and previous correspondence, interpretations, or clarifications, the Contractor shall be liable to the Owner for reasonable charges from the Architect for the additional services required to review, research, and respond to such requests for information.

ARTICLE 8 SURVEYS by CONTRACTOR

- A. The Contractor shall provide competent engineering services to assure accurate execution of the Work in accordance with the Contract Documents. The Contractor shall verify the figures given for the contours, approaches and locations shown on the Drawings before starting any Work and be responsible for the accuracy of the finished Work. Without extra cost to the Owner, the Contractor shall engage a licensed surveyor if necessary to verify boundary lines, keep within property lines, and shall be responsible for encroachments on rights or property of public or surrounding property owners.
- **B.** The Contractor shall establish all base lines for the location of the principal components of the Work and make all detail surveys necessary for construction, including grade stakes, batter boards and other working points, lines and elevations. If the Work involves alteration of or addition to existing structures or improvements, the Contractor shall locate and measure elements of the existing conditions as is necessary to facilitate accurate fabrication, assembly, and installation of new Work in the relationship, alignment, and/or connection to the existing structure or improvement as is shown in the Contract Documents.

ARTICLE 9 SUBMITTALS

- **A.** Where required by the Contract Documents, the Contractor shall submit shop drawings, product data, samples and other information (hereinafter referred to as Submittals) to the Architect for the purpose of demonstrating the way by which the Contractor proposes to conform to the requirements of the Contract Documents. Submittals which are not required by the Contract Documents may be returned by the Architect without action.
- **B.** The Contractor shall be responsible to the Owner for the accuracy of its Submittals and the conformity of its submitted information to the requirements of the Contract Documents. Each Submittal shall bear the Contractor's approval, evidencing that the Contractor has reviewed and found the information to be in compliance with the requirements of the Contract Documents. Submittals which are not marked as reviewed and approved by the Contractor may be returned by the Architect without action.
- **C.** The Contractor shall prepare and deliver its submittals to the Architect sufficiently in advance of construction requirements and in a sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors. In coordinating the Submittal process with its construction schedule, the Contractor shall allow sufficient time to permit adequate review by the Architect.
- **D.** By approving a Submittal the Contractor represents not only that the element of Work presented in the Submittal complies with the requirements of the Contract Documents, but also that the Contractor has:

(1) found the layout and/or dimensions in the Submittal to be comparable with those in the Contract Documents and other relevant Submittals and has made field measurements as necessary to verify their accuracy, and

(2) determined that products, materials, systems, equipment and/or procedures presented in the Submittal are compatible with those presented, or being presented, in other relevant Submittals and

with the Contractor's intended Construction Methods.

- **E.** The Contractor shall not fabricate or perform any portion of the Work for which the Contract Documents require Submittals until the respective Submittals have been approved by the Architect.
- **F.** In the case of a resubmission, the Contractor shall direct specific attention to all revisions in a Submittal. The Architect's approval of a resubmission shall not apply to any revisions that were not brought to the Architect's attention.
- **G.** If the Contract Documents specify that a Submittal is to be prepared and sealed by a registered architect or licensed engineer retained by the Contractor, all drawings, calculations, specifications, and certifications of the Submittal shall bear the Alabama seal of registration and signature of the registered/licensed design professional who prepared them or under whose supervision they were prepared. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of such a Submittal, provided that all performance and design criteria that such Submittal must satisfy are sufficiently specified in the Contract Documents. The Architect will review, approve or take other appropriate action on such a Submittal only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance or design criteria specified in the Contract Documents.

H. <u>DEVIATIONS</u>

(1) The Architect is authorized by the Owner to approve "minor" deviations from the requirements of the Contract Documents. "Minor" deviations are defined as those which are in the interest of the Owner, do not materially alter the quality or performance of the finished Work, and do not affect the cost or time of performance of the Work. Deviations which are not "minor" may be authorized only by the Owner through the Change Order procedures of Article 19.

(2) Any deviation from the requirements of the Contract Documents contained in a Submittal shall be clearly identified as a "Deviation from Contract Requirements" (or by similar language) within the Submittal and, in a letter transmitting the Submittal to the Architect, the Contractor shall direct the Architect's attention to, and request specific approval of, the deviation. Otherwise, the Architect's approval of a Submittal does not constitute approval of deviations from the requirements of the Contract Documents contained in the Submittal.

(3) The Contractor shall bear all costs and expenses of any changes to the Work, changes to work performed by the Owner or separate contractors, or additional services by the Architect required to accommodate an approved deviation unless the Contractor has specifically informed the Architect in writing of the required changes and a Change Order has been issued authorizing the deviation and accounting for such resulting changes and costs.

I. <u>ARCHITECT'S REVIEW and APPROVAL</u>

(1) The Architect will review the Contractor's Submittals for conformance with requirements of, and the design concept expressed in, the Contract Documents and will approve or take other appropriate action upon them. This review is not intended to verify the accuracy and completeness of details such as dimensions and quantities nor to substantiate installation instructions or performance of equipment or systems, all of which remain the responsibility of the Contractor. However, the Architect shall advise the Contractor of any errors or omissions which the Architect

may detect during this review. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

(2) The Architect will review and respond to all Submittals with reasonable promptness to avoid delay in the Work or in the activities of the Owner, Contractor or separate contractors, while allowing sufficient time to permit adequate review.

(3) No corrections or changes to Submittals indicated by the Architect will be considered as authorizations to perform Extra Work. If the Contractor considers such correction or change of a Submittal to require Work which differs from the requirements of the Contract Documents, the Contractor shall promptly notify the Architect in writing in accordance with Article 20, Claims for Extra Cost or Extra Work.

J. <u>CONFORMANCE with SUBMITTALS</u>

The Work shall be constructed in accordance with approved Submittals.

ARTICLE 10 DOCUMENTS and SAMPLES at the SITE

A. <u>"AS ISSUED" SET</u>

The Contractor shall maintain at the Project site, in good order, at least one copy of all Addenda, Change Orders, supplemental drawings, written directives and clarifications, and approved Submittals intact as issued, and an updated construction schedule.

B. <u>"POSTED" SET</u>

The Contractor shall maintain at the Project site, in good order, at least one set of the Drawings and Project Manual into which the Contractor has "posted"(incorporated) all Addenda, Change Orders, supplemental drawings, clarifications, and other information pertinent to the proper performance of the Work. The Contractor shall assure that all sets of the Drawings and Project Manuals being used by the Contractor, Subcontractors, and suppliers are "posted" with the current information to insure that updated Contract Documents are used for performance of the Work.

C. <u>RECORD SET</u>

One set of the Drawings and Project Manual described in Paragraph B shall be the Contractor's record set in which the Contractor shall record all field changes, corrections, selections, final locations, and other information as will be duplicated on the "As-built" documents required under Article 11. The Contractor shall record such "as-built" information in its record set as it becomes available through progress of the Work. The Contractor's performance of this requirement shall be subject to confirmation by the Architect at any time as a prerequisite to approval of Progress Payments.

D. The documents and samples required by this Article to be maintained at the Project site shall be readily available to the Architect, Owner, DCM Project Inspector, and their representatives.

ARTICLE 11 "AS-BUILT" DOCUMENTS

- A. Unless otherwise provided in the Contract Documents, the Contractor shall deliver two (2) sets of "As-built" documents, as described herein, to the Architect for submission to the Owner upon completion of the Work. Each set of "As-built' documents shall consist of a copy of the Drawings and Project Manual, in like-new condition, into which the Contractor has neatly incorporated all Addenda, Change Orders, supplemental drawings, clarifications, field changes, corrections, selections, actual locations of underground utilities, and other information as required herein or specified elsewhere in the Contract Documents.
- **B.** The Contractor shall use the following methods for incorporating information into the "As-built" documents:

(1) Drawings

(a) To the greatest extent practicable, information shall be carefully drawn and lettered, in ink, on the Drawings in the form of sketches, details, plans, notes, and dimensions as required to provide a fully dimensioned record of the Work. When required for clarity, sketches, details, or partial plans shall be drawn on supplemental sheets and bound into the Drawings and referenced on the drawing being revised.

(b) Where a revised drawing has been furnished by the Architect, the drawing of latest date shall be bound into the Drawings in the place of the superseded drawing.

(c) Where a supplemental drawing has been furnished by the Architect, the supplemental drawing shall be bound into the Drawings in an appropriate location and referred to by notes added to the drawing being supplemented.

(d) Where the Architect has furnished details, partial plans, or lengthy notes of which it would be impractical for the Contractor to redraw or letter on a drawing, such information may be affixed to the appropriate drawing with transparent tape if space is available on the drawing.

(e) Any entry of information made in the Drawings that is the result of an Addendum or Change Order, shall identify the Addendum or Change Order from which it originated.

(2) **Project Manual**

(a) A copy of all Addenda and Change Orders, excluding drawings thereof, shall be bound in the front of the Project Manual.

(b) Where a document, form, or entire specification section is revised, the latest issue shall be bound into the Project Manual in the place of the superseded issue.

(c) Where information within a specification section is revised, the deleted or revised information shall be drawn through in ink and an adjacent note added identifying the Addendum or Change Order containing the revised information.

C. Within ten days after the Date of Substantial Completion of the Work, or the last completed portion of the Work, the Contractor shall submit the "As-built" documents to the Architect for approval. If the Architect requires that any corrections be made, the documents will be returned in a reasonable time for correction and resubmission.

ARTICLE 12 PROGRESS SCHEDULE

(Not applicable if the Contract Time is 60 days or less.)

- A. The Contractor shall within fifteen days after the date of commencement stated in the Notice to Proceed, or such other time as may be provided in the Contract Documents, prepare and submit to the Architect for review and approval a practicable construction schedule informing the Architect and Owner of the order in which the Contractor plans to carry on the Work within the Contract Time. The Architect's review and approval of the Contractor's construction schedule shall be only for compliance with the specified format, Contract Time, and suitability for monitoring progress of the Work and shall not be construed as a representation that the Architect has analyzed the schedule to form opinions of sequences or durations of time represented in the schedule.
- **B.** If a schedule format is not specified elsewhere in the Contract Documents, the construction schedule shall be prepared using DCM Form C-11, "Progress Schedule and Report", (contained in the Project Manual) or similar format of suitable scale and detail to indicate the percentage of Work scheduled to be completed at the end of each month. At the end of each month the Contractor shall enter the actual percentage of completion on the construction schedule submit two copies to the Architect, and attach one copy to each copy of the monthly Application for Payment. The construction schedule shall be revised to reflect any agreed extensions of the Contract Time or as required by conditions of the Work.
- **C.** If a more comprehensive schedule format is specified elsewhere in the Contract Documents or voluntarily employed by the Contractor, it may be used in lieu of DCM Form C-11.
- **D.** The Contractor's construction schedule shall be used by the Contractor, Architect, and Owner to determine the adequacy of the Contractor's progress. The Contractor shall be responsible for maintaining progress in accordance with the currently approved construction schedule and shall increase the number of shifts, and/or overtime operations, days of work, and/or the amount of construction plant and equipment as may be necessary to do so. If the Contractor's progress falls materially behind the currently approved construction schedule and, in the opinion of the Architect or Owner, the Contractor is not taking sufficient steps to regain schedule, the Architect may, with the Owner's concurrence, issue the Contractor a Notice to Cure pursuant to Article 27. In such a Notice to Cure the Architect may require the Contractor to submit such supplementary or revised construction schedules as may be deemed necessary to demonstrate the manner in which schedule will be regained.

ARTICLE 13 EQUIPMENT, MATERIALS, and SUBSTITUTIONS

- A. Every part of the Work shall be executed in a workmanlike manner in accordance with the Contract Documents and approved Submittals. All materials used in the Work shall be furnished in sufficient quantities to facilitate the proper and expeditious execution of the Work and shall be new except such materials as may be expressly provided or allowed in the Contract Documents to be otherwise.
- **B.** Whenever a product, material, system, item of equipment, or service is identified in the Contract Documents by reference to a trade name, manufacturer's name, model number, etc.(hereinafter

referred to as "source"), and only one or two sources are listed, or three or more sources are listed and followed by "or approved equal" or similar wording, it is intended to establish a required standard of performance, design, and quality, and the Contractor may submit, for the Architect's approval, products, materials, systems, equipment, or services of other sources which the Contractor can prove to the Architect's satisfaction are equal to, or exceed, the standard of performance, design and quality specified, unless the provisions of Paragraph D below apply. Such proposed substitutions are not to be purchased or installed without the Architect's written approval of the substitution.

- **C.** If the Contract Documents identify three or more sources for a product, material, system, item of equipment or service to be used and the list of sources is not followed by "or approved equal" or similar wording, the Contractor may make substitution only after evaluation by the Architect and execution of an appropriate Contract Change Order.
- **D.** If the Contract Documents identify only one source and expressly provide that it is an approved sole source for the product, material, system, item of equipment, or service, the Contractor must furnish the identified sole source.

ARTICLE 14 <u>SAFETY and PROTECTION of PERSONS and PROPERTY</u>

- A. The Contractor shall be solely and completely responsible for conditions at the Project site, including safety of all persons (including employees) and property. The Contractor shall create, maintain, and supervise conditions and programs to facilitate and promote safe execution of the Work, and shall supervise the Work with the attention and skill required to assure its safe performance. Safety provisions shall conform to OSHA requirements and all other federal, state, county, and local laws, ordinances, codes, and regulations. Where any of these are in conflict, the more stringent requirement shall be followed. Nothing contained in this Contract shall be construed to mean that the Owner has employed the Architect nor has the Architect employed its consultants to administer, supervise, inspect, or take action regarding safety programs or conditions at the Project site.
- **B.** The Contractor shall employ Construction Methods, safety precautions, and protective measures that will reasonably prevent damage, injury or loss to:
 - (1) workers and other persons on the Project site and in adjacent and other areas that may be affected by the Contractor's operations;
 - (2) the Work and materials and equipment to be incorporated into the Work and stored by the Contractor on or off the Project site; and
 - (3) other property on, or adjacent to, the Project site, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and other improvements not designated in the Contract Documents to be removed, relocated, or replaced.
- **C.** The Contractor shall be responsible for the prompt remedy of damage and loss to property, including the filing of appropriate insurance claims, caused in whole or in part by the fault or negligence of the Contractor, a Subcontractor, or anyone for whose acts they may be liable.

- **D.** The Contractor shall comply with and give notices required by applicable laws, ordinances, rules, regulations and lawful orders of public authorities bearing on safety and protection of persons or property, including without limitation notices to adjoining property owners of excavation or other construction activities that potentially could cause damage or injury to adjoining property or persons thereon.
- **E.** The Contractor shall erect and maintain barriers, danger signs, and any other reasonable safeguards and warnings against hazards as may be required for safety and protection during performance of the Contract and shall notify owners and users of adjacent sites and utilities of conditions that may exist or arise which may jeopardize their safety.
- **F.** If use or storage of explosives or other hazardous materials or equipment or unusual Construction Methods are necessary for execution of the Work, the Contractor shall exercise commensurate care and employ supervisors and workers properly qualified to perform such activity.
- **G.** The Contractor shall furnish a qualified safety representative at the Project site whose duties shall include the prevention of accidents. The safety representative shall be the Contractor's superintendent, unless the Contractor assigns this duty to another responsible member of its on-site staff and notifies the Owner and Architect in writing of such assignment.
- **H.** The Contractor shall not permit a load to be applied, or forces introduced, to any part of the construction or site that may cause damage to the construction or site or endanger safety of the construction, site, or persons on or near the site.
- **I.** The Contractor shall have the right to act as it deems appropriate in emergency situations jeopardizing life or property. The Contractor shall be entitled to equitable adjustment of the Contract Sum or Contract Time for its efforts expended for the sole benefit of the Owner in an emergency. Such adjustment shall be determined as provided in Articles 19 and 20.
- **J.** The duty of the Architect and the Architect's consultants to visit the Project site to conduct periodic inspections of the Work or for other purposes shall not give rise to a duty to review or approve the adequacy of the Contractor's safety program, safety supervisor, or any safety measure which Contractor takes or fails to take in, on, or near the Project site.

ARTICLE 15 HAZARDOUS MATERIALS

- **A.** A Hazardous Material is any substance or material identified as hazardous under any federal, state, or local law or regulation, or any other substance or material which may be considered hazardous or otherwise subject to statutory or regulatory requirements governing its handling, disposal, and/or clean-up. Existing Hazardous Materials are Hazardous Materials discovered at the Project site and not introduced to the Project site by the Contractor, a Subcontractor, or anyone for whose acts they may be liable.
- **B.** If, during the performance of the Work, the Contractor encounters a suspected Existing Hazardous Material, the Contractor shall immediately stop work in the affected area, take measures appropriate to the condition to keep people away from the suspected Existing Hazardous Material, and

immediately notify the Architect and Owner of the condition in writing.

- **C.** The Owner shall obtain the services of an independent laboratory or professional consultant, appropriately licensed and qualified, to determine whether the suspected material is a Hazardous Material requiring abatement and, if so, to certify after its abatement that it has been rendered harmless. Any abatement of Existing Hazardous Materials will be the responsibility of the Owner. The Owner will advise the Contractor in writing of the persons or entities who will determine the nature of the suspected material and those who will, if necessary, perform the abatement. The Owner will not employ persons or entities to perform these services to whom the Contractor or Architect has reasonable objection.
- **D.** After certification by the Owner's independent laboratory or professional consultant that the material is harmless or has been rendered harmless, work in the affected area shall resume upon written agreement between the Owner and Contractor. If the material is found to be an Existing Hazardous Material and the Contractor incurs additional cost or delay due to the presence and abatement of the material, the Contract Sum and/or Contract Time shall be appropriately adjusted by a Contract Change Order pursuant to Article 19.
- **E.** The Owner shall not be responsible for Hazardous Materials introduced to the Project site by the Contractor, a Subcontractor, or anyone for whose acts they may be liable unless such Hazardous Materials were required by the Contract Documents.

ARTICLE 16 INSPECTION of the WORK

A. <u>GENERAL</u>

(1) The Contractor is solely responsible for the Work's compliance with the Contract Documents; therefore, the Contractor shall be responsible to inspect in-progress and completed Work, and shall verify its compliance with the Contract Documents and that any element or portion of the Work upon which subsequent Work is to be applied or performed is in proper condition to receive the subsequent Work. Neither the presence nor absence of inspections by the Architect, Owner, Director, DCM Project Inspector, any public authority having jurisdiction, or their representatives shall relieve the Contractor of responsibility to inspect the Work, for responsibility for Construction Methods and safety precautions and programs in connection with the Work, or from any other requirement of the Contract Documents.

(2) The Architect, Owner, Director, DCM Project Inspector, any public authority having jurisdiction, and their representatives shall have access at all times to the Work for inspection whenever it is in preparation or progress, and the Contractor shall provide proper facilities for such access and inspection. All materials, workmanship, processes of manufacture, and methods of construction, if not otherwise stipulated in the Contract Documents, shall be subject to inspection, examination, and test at any and all places where such manufacture and/or construction are being carried on. Such inspections will not unreasonably interfere with the Contractor's operations.

(3) The Architect will inspect the Work as a representative of the Owner. The Architect's inspections may be supplemented by inspections by the DCM Project Inspector as a representative of the Alabama Division of Construction Management.

(4) The Contractor may be charged by the Owner for any extra cost of inspection incurred by the Owner or Architect on account of material and workmanship not being ready at the time of inspection set by the Contractor.

B. <u>TYPES of INSPECTIONS</u>

(1) SCHEDULED INSPECTIONS and CONFERENCES. Scheduled Inspections and Conferences are conducted by the Architect, scheduled by the Architect in coordination with the Contractor and DCM Project Inspector, and are attended by the Contractor and applicable Subcontractors, suppliers and manufacturers, and the DCM Project Inspector. Scheduled Inspections and Conferences of this Contract include:

- (a) Pre-construction Conference.
- (b) **Pre-roofing Conference** (not applicable if the Contract involves no roofing work)

(c) Above Ceiling Inspection(s): An above ceiling inspection of all spaces in the building is required before the ceiling material is installed. Above ceiling inspections are to be conducted at a time when all above ceiling systems are complete and tested to the greatest extent reasonable pending installation of the ceiling material. System identifications and markings are to be complete. All fire-rated construction including fire-stopping of penetrations and specified identification above the ceiling shall be complete. Ceiling framing and suspension systems shall be complete with lights, grilles and diffusers, access panels, fire protection drops for sprinkler heads, etc., installed in their final locations to the greatest extent reasonable. Above ceiling framing to support ceiling mounted equipment shall be complete. The above ceiling construction shall be complete to the extent that after the inspection the ceiling material can be installed without disturbance.

(d) Final Inspection(s): A Final Inspection shall establish that the Work, or a designated portion of the Work, is Substantially Complete in accordance with Article 32 and is accepted by the Architect, Owner, and DCM Project Inspector as being ready for the Owner's occupancy or use. At the conclusion of this inspection, items requiring correction or completion ("punch list" items) shall be minimal and require only a short period of time for accomplishment to establish Final Acceptance of the Work. If the Work, or designated portion of the Work, includes the installation, or modification, of a fire alarm system or other life safety systems essential to occupancy, such systems shall have been tested and appropriately certified before the Final Inspection.

(e) Year-end Inspection(s): An inspection of the Work, or each separately completed portion thereof, is required near the end of the Contractor's one year warranty period(s). The subsequent delivery of the Architect's report of this inspection will serve as confirmation that the Contractor was notified of Defective Work found within the warranty period in accordance with Article 35.

(2) **PERIODIC INSPECTIONS.** Periodic Inspections are conducted throughout the course of the Work by the Architect, the Architect's consultants, their representatives, and the DCM Project Inspector, jointly or independently, with or without advance notice to the Contractor.

(3) SPECIFIED INSPECTIONS and TESTS. Specified Inspections and Tests include inspections, tests, demonstrations, and approvals that are either specified in the Contract Documents or required by laws, ordinances, rules, regulations, or orders of public authorities having jurisdiction, to be performed by the Contractor, one of its Subcontractors, or an independent testing laboratory or firm (whether paid for by the Contractor or Owner).

C. **INSPECTIONS by the ARCHITECT**

(1) The Architect is not authorized to revoke, alter, relax, or waive any requirements of the Contract Documents (other than "minor" deviations as defined in Article 9 and "minor" changes as defined in Article 19), to finally approve or accept any portion of the Work or to issue instructions contrary to the Contract Documents without concurrence of the Owner.

(2) The Architect will visit the site at intervals appropriate to the stage of the Contractor's operations and as otherwise necessary to:

(a) become generally familiar with the in-progress and completed Work and the quality of the Work,

(b) determine whether the Work is progressing in general accordance with the Contractor's schedule and is likely to be completed within the Contract Time,

(c) visually compare readily accessible elements of the Work to the requirements of the Contract Documents to determine, in general, if the Contractor's performance of the Work indicates that the Work will conform to the requirements of the Contract Documents when completed,

(d) endeavor to guard the Owner against Defective Work,

(e) review and address with the Contractor any problems in implementing the requirements of the Contract Documents that the Contractor may have encountered, and

(f) keep the Owner fully informed about the Project.

(3) The Architect shall have the authority to reject Defective Work or require its correction, but shall not be required to make exhaustive investigations or examinations of the in-progress or completed portions of the Work to expose the presence of Defective Work. However, it shall be an obligation of the Architect to report in writing, to the Owner, Contractor, and DCM Project Inspector, any Defective Work recognized by the Architect.

(4) The Architect shall have the authority to require the Contractor to stop work only when, in the Architect's reasonable opinion, such stoppage is necessary to avoid Defective Work. The Architect shall not be liable to the Contractor or Owner for the consequences of any decisions made by the Architect in good faith either to exercise or not to exercise this authority.

(5) "Inspections by the Architect" includes appropriate inspections by the Architect's consultants as dictated by their respective disciplines of design and the stage of the Contractor's operations.

D. INSPECTIONS by the DCM PROJECT INSPECTOR

- (1) The DCM Project Inspector will:
 - (a) participate in scheduled inspections and conferences as practicable,

(b) perform periodic inspections of in-progress and completed Work to ensure code compliance of the Project and general conformance of the Work with the Contract Documents, and

(c) monitor the Contractor's progress and performance of the Work.

(2) The DCM Project Inspector shall have the authority to:

(a) reject Work that is not in compliance with the State Building Code adopted by the DCM, unless the Work is in accordance with the Contract Documents in which case the DCM Project Inspector will advise the Architect to initiate appropriate corrective action, and
(b) notify the Architect, Owner, and Contractor of Defective Work recognized by the DCM Project Inspector.

(3) The DCM Project Inspector's periodic inspections will usually be scheduled around key stages of construction based upon information reported by the Architect. As the Architect or Owner deems appropriate, the DCM Project Inspector, as well as other members of the Technical Staff, can be requested to schedule special inspections or meetings to address specific matters. The written findings of DCM Project Inspector will be transmitted to the Owner, Contractor, and Architect.

(4) The DCM Project Inspector is not authorized to revoke, alter, relax, or waive any requirements of the Contract Documents, to finally approve or accept any portion of the Work or to issue instructions contrary to the Contract Documents without concurrence of the Owner. The Contractor shall not proceed with Work as a result of instructions or findings of the DCM Project Inspector which the Contractor considers to be a change to the requirements of the Contract Documents without written authorization of the Owner through the Architect.

E. <u>UNCOVERING WORK</u>

(1) If the Contractor covers a portion of the Work before it is examined by the Architect and this is contrary to the Architect's request or specific requirements in the Contract Documents, then, upon written request of the Architect, the Work must be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

(2) Without a prior request or specific requirement that Work be examined by the Architect before it is covered, the Architect may request that Work be uncovered for examination and the Contractor shall uncover it. If the Work is in accordance with the Contract Documents, the Contract Sum shall be equitably adjusted under Article 19 to compensate the Contractor for the costs of uncovering and replacement. If the Work is not in accordance with the Contract Documents, uncovering, correction, and replacement shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

F. <u>SPECIFIED INSPECTIONS and TESTS</u>

(1) The Contractor shall schedule and coordinate Specified Inspections and Tests to be made at appropriate times so as not to delay the progress of the Work or the work of the Owner or separate contractors. If the Contract Documents require that a Specified Inspection or Test be witnessed or attended by the Architect or Architect's consultant, the Contractor shall give the Architect timely notice of the time and place of the Specified Inspection or Test. If a Specified Inspection or Test reveals that Work is not in compliance with requirements of the Contract Documents, the Contractor shall bear the costs of correction, repeating the Specified Inspection or Test, and any related costs incurred by the Owner, including reasonable charges, if any, by the Architect for additional services. Through appropriate Contract Change Order the Owner shall bear costs of tests, inspections or approvals which become Contract requirements subsequent to the receipt of bids.

(2) If the Architect, Owner, or public authority having jurisdiction determines that inspections, tests, demonstrations, or approvals in addition to Specified Inspections and Tests are required, the Contractor shall, upon written instruction from the Architect, arrange for their performance by an entity acceptable to the Owner, giving timely notice to the architect of the time and place of their performance. Related costs shall be borne by the Owner unless the procedures reveal that Work is

not in compliance with requirements of the Contract Documents, in which case the Contractor shall bear the costs of correction, repeating the procedures, and any related costs incurred by the Owner, including reasonable charges, if any, by the Architect for additional services.

(3) Unless otherwise required by the Contract Documents, required certificates of Specified Inspections and Tests shall be secured by the Contractor and promptly delivered to the Architect.

(4) Failure of any materials to pass Specified Inspections and Tests will be sufficient cause for refusal to consider any further samples of the same brand or make of that material for use in the Work.

ARTICLE 17 CORRECTION of DEFECTIVE WORK

- **A.** The Contractor shall, at the Contractor's expense, promptly correct Defective Work rejected by the Architect or which otherwise becomes known to the Contractor, removing the rejected or nonconforming materials and construction from the project site.
- **B.** Correction of Defective Work shall be performed in such a timely manner as will avoid delay of completion, use, or occupancy of the Work and the work of the Owner and separate contractors.
- C. The Contractor shall bear all expenses related to the correction of Defective Work, including but not limited to: (1) additional testing and inspections, including repeating Specified Inspections and Tests, (2) reasonable services and expenses of the Architect, and (3) the expense of making good all work of the Contractor, Owner, or separate contractors destroyed or damaged by the correction of Defective Work.

ARTICLE 18 DEDUCTIONS for UNCORRECTED WORK

If the Owner deems it advisable and in the Owner's interest to accept Defective Work, the Owner may allow part or all of such Work to remain in place, provided an equitable deduction from the Contract Sum, acceptable to the Owner, is offered by the Contractor.

ARTICLE 19 CHANGES in the WORK

A. <u>GENERAL</u>

(1) The Owner may at any time direct the Contractor to make changes in the Work which are within the general scope of the Contract, including changes in the Drawings, Specifications, or other portions of the Contract Documents to add, delete, or otherwise revise portions of the Work. The Architect is authorized by the Owner to direct "minor" changes in the Work by written order to the Contractor. "Minor" changes in the Work are defined as those which are in the interest of the Owner, do not materially alter the quality or performance of the finished Work, and do not affect the cost or time of performance of the Work. Changes in the Work which are not "minor" may be

authorized only by the Owner.

(2) If the Owner directs a change in the Work, the change shall be incorporated into the Contract by a Contract Change Order prepared by the Architect and signed by the Contractor, Owner, and other signatories to the Construction Contract, stating their agreement upon the change or changes in the Work and the adjustments, if any, in the Contract Sum and the Contract Time.

(3) Subject to compliance with Alabama's Public Works Law, the Owner may, upon agreement by the Contractor, incorporate previously unawarded bid alternates into the Contract.

(4) In the event of a claim or dispute as to the appropriate adjustment to the Contract Sum or Contract Time due to a directive to make changes in the Work, the Work shall proceed as provided in this article subject to subsequent agreement of the parties or final resolution of the dispute pursuant to Article 24.

(5) Consent of surety will be obtained for all Contract Change Orders involving an increase in the Contract Sum.

(6) Changes in the Work shall be performed under applicable provisions of the Contract Documents and the Contractor shall proceed promptly to perform changes in the Work, unless otherwise directed by the Owner through the Architect.

(7) All change orders require DCM Form C-12: Contract Change Order and DCM Form B-11: Change Order Justification. Only Change Orders 10% or greater of the current contract amount require the Owner's legal advisor's signature on DCM Form B-11: Change Order Justification.

B. DETERMINATION of ADJUSTMENT of the CONTRACT SUM

The adjustment of the Contract Sum resulting from a change in the Work shall be determined by one of the following methods, or a combination thereof, as selected by the Owner:

(1) Lump Sum. By mutual agreement to a lump sum based on or negotiated from an itemized cost proposal from the Contractor. Additions to the Contract Sum shall include the Contractor's direct costs plus a maximum 15% markup for overhead and profit. Where subcontract work is involved the total mark-up for the Contractor and a Subcontractor shall not exceed 25%. Changes which involve a net credit to the Owner shall include fair and reasonable credits for overhead and profit on the deducted work, in no case less than 5%. For the purposes of this method of determining an adjustment of the Contract Sum, "overhead" shall cover the Contractor's indirect costs of the change, such as the cost of bonds, superintendent and other job office personnel, watchman, job office, job office supplies and expenses, temporary facilities and utilities, and home office expenses.

(2) Unit Price. By application of Unit Prices included in the Contract or subsequently agreed to by the parties. However, if the character or quantity originally contemplated is materially changed so that application of such unit price to quantities of Work proposed will cause substantial inequity to either party, the applicable unit price shall be equitably adjusted.

(3) Force Account. By directing the Contractor to proceed with the change in the Work on a "force account" basis under which the Contractor shall be reimbursed for reasonable expenditures incurred by the Contractor and its Subcontractors in performing added Work and the Owner shall

receive reasonable credit for any deleted Work. The Contractor shall keep and present, in such form as the Owner may prescribe, an itemized accounting of the cost of the change together with sufficient supporting data. Unless otherwise stated in the directive, the adjustment of the Contract Sum shall be limited to the following:

(a) costs of labor and supervision, including employee benefits, social security, retirement, unemployment and workers' compensation insurance required by law, agreement, or under Contractor's or Subcontractor's standard personnel policy;

(b) cost of materials, supplies and equipment, including cost of delivery, whether incorporated or consumed;

(c) rental cost of machinery and equipment, not to exceed prevailing local rates if contractorowned;

(d) costs of premiums for insurance required by the Contract Documents, permit fees, and sales, use or similar taxes related to the change in the Work;

(e) reasonable credits to the Owner for the value of deleted Work, without Contractor or Subcontractor mark-ups; and

(f) for additions to the Contract Sum, mark-up of the Contractor's direct costs for overhead and profit not exceeding 15% on Contractor's work nor exceeding 25% for Contractor and Subcontractor on a Subcontractor's work. Changes which involve a net credit to the Owner shall include fair and reasonable credits for overhead and profit on the deducted work, in no case less than 5%. For the purposes of this method of determining an adjustment of the Contract Sum, "overhead" shall cover the Contractor's indirect costs of the change, such as the cost of insurance other than mentioned above, bonds, superintendent and other job office personnel, watchman, use and rental of small tools, job office, job office supplies and expenses, temporary facilities and utilities, and home office expenses.

C. <u>ADJUSTMENT of the CONTRACT TIME due to CHANGES</u>

(1) Unless otherwise provided in the Contract Documents, the Contract Time shall be equitably adjusted for the performance of a change provided that the Contractor notifies the Architect in writing that the change will increase the time required to complete the Work. Such notice shall be provided no later than:

(a) with the Contractor's cost proposal stating the number of days of extension requested, or

(b) within ten days after the Contractor receives a directive to proceed with a change in advance of submitting a cost proposal, in which case the notice should provide an estimated number of days of extension to be requested, which may be subject to adjustment in the cost proposal.

(2) The Contract Time shall be extended only to the extent that the change affects the time required to complete the entire Work of the Contract, taking into account the concurrent performance of the changed and unchanged Work.

D. <u>CHANGE ORDER PROCEDURES</u>

(1) If the Owner proposes to make a change in the Work, the Architect will request that the Contractor provide a cost proposal for making the change to the Work. The request shall be in writing and shall adequately describe the proposed change using drawings, specifications, narrative, or a combination thereof. Within 21 days after receiving such a request, or such other time as may be stated in the request, the Contractor shall prepare and submit to the Architect a written proposal, properly itemized and supported by sufficient substantiating data to facilitate evaluation. The stated

time within which the Contractor must submit a proposal may be extended if, within that time, the Contractor makes a written request with reasonable justification thereof.

(2) The Contractor may voluntarily offer a change proposal which, in the Contractor's opinion, will reduce the cost of construction, maintenance, or operation or will improve the cost-effective performance of an element of the Project, in which case the Owner, through the Architect, will accept, reject, or respond otherwise within 21 days after receipt of the proposal, or such other reasonable time as the Contractor may state in the proposal.

(3) If the Contractor's proposal is acceptable to the Owner, or is negotiated to the mutual agreement of the Contractor and Owner, the Architect will prepare an appropriate Contract Change Order for execution. Upon receipt of the fully executed Contract Change Order, the Contractor shall proceed with the change.

(4) In advance of delivery of a fully executed Contract Change Order, the Architect may furnish to the Contractor a written authorization to proceed with an agreed change. However, such an authorization shall be effective only if it:

- (a) identifies the Contractor's accepted or negotiated proposal for the change,
- (b) states the agreed adjustments, if any, in Contract Sum and Contract Time,
- (c) states that funds are available to pay for the change, and
- (d) is signed by the Owner.

(5) If the Contractor and Owner cannot agree on the amount of the adjustment in the Contract Sum for a change, the Owner, through the Architect, may order the Contractor to proceed with the change on a Force Account basis, but the net cost to the Owner shall not exceed the amount quoted in the Contractor's proposal. Such order shall state that funds are available to pay for the change.

(6) If the Contractor does not promptly respond to a request for a proposal, or the Owner determines that the change is essential to the final product of the Work and that the change must be effected immediately to avoid delay of the Project, the Owner may:

(a) determine with the Contractor a sufficient maximum amount to be authorized for the change and

(b) direct the Contractor to proceed with the change on a Force Account basis pending delivery of the Contractor's proposal, stating the maximum increase in the Contract Sum that is authorized for the change.

(7) Pending agreement of the parties or final resolution of any dispute of the total amount due the Contractor for a change in the Work, amounts not in dispute for such changes in the Work may be included in Applications for Payment accompanied by an interim Change Order indicating the parties' agreement with part of all of such costs or time extension. Once a dispute is resolved, it shall be implemented by preparation and execution of an appropriate Change Order.

ARTICLE 20 CLAIMS for EXTRA COST or EXTRA WORK

A. If the Contractor considers any instructions by the Architect, Owner, DCM Project Inspector, or public authority having jurisdiction to be contrary to the requirements of the Contract Documents and will involve extra work and/or cost under the Contract, the Contractor shall give the Architect

written notice thereof within ten days after receipt of such instructions, and in any event before proceeding to execute such work. As used in this Article, "instructions" shall include written or oral clarifications, directions, instructions, interpretations, or determinations.

- **B.** The Contractor's notification pursuant to Paragraph 20.A shall state: (1) the date, circumstances, and source of the instructions, (2) that the Contractor considers the instructions to constitute a change to the Contract Documents and why, and (3) an estimate of extra cost and time that may be involved to the extent an estimate may be reasonably made at that time.
- **C.** Except for claims relating to an emergency endangering life or property, no claim for extra cost or extra work shall be considered in the absence of prior notice required under Paragraph 20.A.
- **D.** Within ten days of receipt of a notice pursuant to Paragraph 20.A, the Architect will respond in writing to the Contractor, stating one of the following:
 - (1) The cited instruction is rescinded.

(2) The cited instruction is a change in the Work and in which manner the Contractor is to proceed with procedures of Article 19, Changes in the Work.

(3) The cited instruction is reconfirmed, is not considered by the Architect to be a change in the Contract Documents, and the Contractor is to proceed with Work as instructed.

E. If the Architect's response to the Contractor is as in Paragraph 20.D(3), the Contractor shall proceed with the Work as instructed. If the Contractor continues to consider the instructions to constitute a change in the Contract Documents, the Contractor shall, within ten days after receiving the Architect's response, notify the Architect in writing that the Contractor intends to submit a claim pursuant to Article 24, Resolution of Claims and Disputes

ARTICLE 21 DIFFERING SITE CONDITIONS

A. <u>DEFINITION</u>

"Differing Site Conditions" are:

- (1) subsurface or otherwise concealed physical conditions at the Project site which differ materially from those indicated in the Contract Documents, or
- (2) unknown physical conditions at the Project site which are of an unusual nature, differing materially from conditions ordinarily encountered and generally recognized as inherent in construction activities of the character required by the Contract Documents.

B. <u>PROCEDURES</u>

If Differing Site Conditions are encountered, then the party discovering the condition shall promptly notify the other party before the condition is disturbed and in no event later than ten days after discovering the condition. Upon such notice and verification that a Differing Site Condition exists, the Architect will, with reasonable promptness and with the Owner's concurrence, make changes in the Drawings and/or Specifications as are deemed necessary to conform to the Differing

Site Condition. Any increase or decrease in the Contract Sum or Contract Time that is warranted by the changes will be made as provided under Article 19, Changes in the Work. If the Architect determines a Differing Site Condition has not been encountered, the Architect shall notify the Owner and Contractor in writing, stating the reason for that determination.

ARTICLE 22 CLAIMS for DAMAGES

If either party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time after the discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

ARTICLE 23 DELAYS

- **A.** A delay beyond the Contractor's control at any time in the commencement or progress of Work by an act or omission of the Owner, Architect, or any separate contractor or by labor disputes, unusual delay in deliveries, unavoidable casualties, fires, abnormal floods, tornadoes, or other cataclysmic events of nature, may entitle the Contractor to an extension of the Contract Time provided, however, that the Contractor shall, within ten days after the delay first occurs, give written notice to the Architect of the cause of the delay and its probable effect on progress of the entire Work.
- **B.** Adverse weather conditions that are more severe than anticipated for the locality of the Work during any given month may entitle the Contractor to an extension of Contract Time provided, however;
 - (1) the weather conditions had an adverse effect on construction scheduled to be performed during the period in which the adverse weather occurred, which in reasonable sequence would have an effect on completion of the entire Work,
 - (2) the Contractor shall, within twenty-one days after the end of the month in which the delay occurs, give the Architect written notice of the delay that occurred during that month and its probable effect on progress of the Work, and
 - (3) within a reasonable time after giving notice of the delay, the Contractor provides the Architect with sufficient data to document that the weather conditions experienced were unusually severe for the locality of the Work during the month in question. Unless otherwise provided in the Contract Documents, data documenting unusually severe weather conditions shall compare actual weather conditions to the average weather conditions for the month in question during the previous five years as recorded by the National Oceanic and Atmospheric Administration (NOAA) or similar record-keeping entities.
- **C.** Adjustments, if any, of the Contract Time pursuant to this Article shall be incorporated into the Contract by a Contract Change Order prepared by the Architect and signed by the Contractor, Owner, and other signatories to the Construction Contract or, at closeout of the Contract, by mutual

written agreement between the Contractor and Owner. The adjustment of the Contract Time shall not exceed the extent to which the delay extends the time required to complete the entire Work of the Contract.

- **D.** The Contractor shall not be entitled to any adjustment of the Contract Sum for damage due to delays claimed pursuant to this Article unless the delay was caused by the Owner or Architect and was either:
 - (1) the result of bad faith or active interference or

(2) beyond the contemplation of the parties and not remedied within a reasonable time after notification by the Contractor of its presence.

ARTICLE 24 RESOLUTION of CLAIMS and DISPUTES

A. <u>APPLICABILITY of ARTICLE</u>

(1) As used in this Article, "Claims and Disputes" include claims or disputes asserted by the Contractor, its Surety, or Owner arising out of or related to the Contract, or its breach, including without limitation claims seeking, under the provisions of the Contract, equitable adjustment of the Contract Sum or Contract Time and claims and disputes arising between the Contractor (or its Surety) and Owner regarding interpretation of the Contract Documents, performance of the Work, or breach of or compliance with the terms of the Contract.

(2) "Resolution" addressed in this Article applies only to Claims and Disputes arising between the Contractor (or its Surety) and Owner and asserted after execution of the Construction Contract and prior to the date upon which final payment is made. Upon making application for final payment the Contractor may reserve the right to subsequent Resolution of existing Claims by including a list of all Claims, in stated amounts, which remain to be resolved and specifically excluding them from any release of claims executed by the Contractor, and in that event Resolution may occur after final payment is made.

B. <u>CONTINUANCE of PERFORMANCE</u>

An unresolved Claim or Dispute shall not be just cause for the Contractor to fail or refuse to proceed diligently with performance of the Contract or for the Owner to fail or refuse to continue to make payments in accordance with the Contract Documents.

C. GOOD FAITH EFFORT to SETTLE

The Contractor and Owner agree that, upon the assertion of a Claim by the other, they will make a good faith effort, with the Architect's assistance and advice, to achieve mutual resolution of the Claim. If mutually agreed, the Contractor and Owner may endeavor to resolve a Claim through mediation. If efforts to settle are not successful, the Claim shall be resolved in accordance with paragraph D or E below, whichever applies.

D FINAL RESOLUTION for STATE-FUNDED CONTRACTS

(1) If the Contract is funded in whole or in part with state funds, the final Resolution of Claims

and Disputes which cannot be resolved by the Contractor (or its Surety) and Owner shall be by the Director, whose decision shall be final, binding, and conclusive upon the Contractor, its Surety, and the Owner.

(2) When it becomes apparent to the party asserting a Claim (the Claimant) that an impasse to mutual resolution has been reached, the Claimant may request in writing to the Director that the Claim be resolved by decision of the Director. Such request by the Contractor (or its Surety) shall be submitted through the Owner. Should the Owner fail or refuse to submit the Contractor's request within ten days of receipt of same, the Contractor may forward such request directly to the Director. Upon receipt of a request to resolve a Claim, the Director will instruct the parties as to procedures to be initiated and followed.

(3) If the respondent to a Claim fails or refuses to participate or cooperate in the Resolution procedures to the extent that the Claimant is compelled to initiate legal proceedings to induce the Respondent to participate or cooperate, the Claimant will be entitled to recover, and may amend its Claim to include, the expense of reasonable attorney's fees so incurred.

E. <u>FINAL RESOLUTION for LOCALLY-FUNDED CONTRACTS</u>

If the Contract is funded in whole with funds provided by a city or county board of education or other local governmental authority and the Contract Documents do not stipulate a binding alternative dispute resolution method, the final resolution of Claims and Disputes which cannot be resolved by the Contractor (or its Surety) and Owner may be by any legal remedy available to the parties. Alternatively, upon the written agreement of the Contractor (or its Surety) and the Owner, final Resolution of Claims and Disputes may be by submission to binding arbitration before a neutral arbitrator or panel or by submission to the Director in accordance with preceding Paragraph D.

ARTICLE 25 OWNER'S RIGHT to CORRECT DEFECTIVE WORK

If the Contractor fails or refuses to correct Defective Work in a timely manner that will avoid delay of completion, use, or occupancy of the Work or work by the Owner or separate contractors, the Architect may give the Contractor written Notice to Cure the Defective Work within a reasonable, stated time. If within ten days after receipt of the Notice to Cure the Contractor has not proceeded and satisfactorily continued to cure the Defective Work or provided the Architect with written verification that satisfactory positive action is in process to cure the Defective Work, the Owner may, without prejudice to any other remedy available to the Owner, correct the Defective Work and deduct the actual cost of the correction from payment then or thereafter due to the Contractor.

ARTICLE 26 OWNER'S RIGHT to STOP or SUSPEND the WORK

A. STOPPING the WORK for CAUSE

If the Contractor fails to correct Defective Work or persistently fails to carry out Work in accordance with the Contract Documents, the Owner may direct the Contractor in writing to stop the Work, or any part of the Work, until the cause for the Owner's directive has been eliminated;

however, the Owner's right to stop the Work shall not be construed as a duty of the Owner to be exercised for the benefit of the Contractor or any other person or entity.

B. <u>SUSPENSION by the OWNER for CONVENIENCE</u>

(1) The Owner may, at any time and without cause, direct the Contractor in writing to suspend, delay or interrupt the Work, or any part of the Work, for a period of time as the Owner may determine.

(2) The Contract Sum and Contract Time shall be adjusted, pursuant to Article 19, for reasonable increases in the cost and time caused by an Owner-directed suspension, delay or interruption of Work for the Owner's convenience. However, no adjustment to the Contract Sum shall be made to the extent that the same or concurrent Work is, was or would have been likewise suspended, delayed or interrupted for other reasons not caused by the Owner.

ARTICLE 27 OWNER'S RIGHT to TERMINATE CONTRACT

A. <u>TERMINATION by the OWNER for CAUSE</u>

(1) **Causes:** The Owner may terminate the Contractor's right to complete the Work, or any designated portion of the Work, if the Contractor:

(a) should be adjudged bankrupt, or should make a general assignment for the benefit of the Contractor's creditors, or if a receiver should be appointed on account of the Contractor's insolvency to the extent termination for these reasons is permissible under applicable law;

(b) refuses or fails to prosecute the Work, or any part of the Work, with the diligence that will insure its completion within the Contract Time, including any extensions, or fails to complete the Work within the Contract Time;

(c) refuses or fails to perform the Work, including prompt correction of Defective Work, in a manner that will insure that the Work, when fully completed, will be in accordance with the Contract Documents;

(d) fails to pay for labor or materials supplied for the Work or to pay Subcontractors in accordance with the respective Subcontract;

(e) persistently disregards laws, ordinances, or rules, regulations or orders of a public authority having jurisdiction, or the instructions of the Architect or Owner; or

(f) is otherwise guilty of a substantial breach of the Contract.

(2) Procedure for Unbonded Construction Contracts (Generally, contracts less than \$50,000):

(a) Notice to Cure: In the presence of any of the above conditions the Architect may give the Contractor written notice to cure the condition within a reasonable, stated time, but not less than ten days after the Contractor receives the notice.

(b) Notice of Termination: If, at the expiration of the time stated in the Notice to Cure, the Contractor has not proceeded and satisfactorily continued to cure the condition or provided the Architect with written verification that satisfactory positive action is in process to cure the condition, the Owner may, without prejudice to any other rights or remedies of the Owner, give the Contractor written notice that the Contractor's right to complete the Work, or a designated portion of the Work, shall terminate seven days after the Contractor's receipt of the

written Notice of Termination.

(c) If the Contractor satisfies a Notice to Cure, but the condition for which the notice was first given reoccurs, the Owner may give the Contractor a seven day Notice of Termination without giving the Contractor another Notice to Cure.

(d) At the expiration of the seven days of the termination notice, the Owner may:

.1 take possession of the site, of all materials and equipment stored on and off site, and of all Contractor-owned tools, construction equipment and machinery, and facilities located at the site, and

.2 finish the Work by whatever reasonable method the Owner may deem expedient.

(e) The Contractor shall not be entitled to receive further payment under the Contract until the Work is completed.

(f) If the Owner's cost of completing the Work, including correction of Defective Work, compensation for additional architectural, engineering, managerial, and administrative services, and reasonable attorneys' fees due to the default and termination, is less than the unpaid balance of the Contract Sum, the excess balance less liquidated damages for delay shall be paid to the Contractor. If such cost to the Owner including attorney's fees, plus liquidated damages, exceeds the unpaid balance of the Contract Sum, the Contract Sum, the Contract shall pay the difference to the Owner. Final Resolution of any claim or Dispute involving the termination or any amount due any party as a result of the termination shall be pursuant to Article 24.

(g) Upon the Contractor's request, the Owner shall furnish to the Contractor a detailed accounting of the Owner's cost of completing the Work.

(3) **Procedure for Bonded Construction Contracts (Generally, contracts over \$50,000):**

(a) Notice to Cure: In the presence of any of the above conditions the Architect may give the Contractor and its Surety written Notice to Cure the condition within a reasonable, stated time, but not less than ten days after the Contractor receives the notice.

(b) Notice of Termination: If, at the expiration of the time stated in the Notice to Cure, the Contractor has not proceeded and satisfactorily continued to cure the condition or provided the Architect with written verification that satisfactory positive action is in process to cure the condition, the Owner may, without prejudice to any other rights or remedies of the Owner, give the Contractor and its Surety written notice declaring the Contractor to be in default under the Contract and stating that the Contractor's right to complete the Work, or a designated portion of the Work, shall terminate seven days after the Contractor's receipt of the written Notice of Termination.

(c) If the Contractor satisfies a Notice to Cure, but the condition for which the notice was first given reoccurs, the Owner may give the Contractor a Notice of Termination without giving the Contractor another Notice to Cure.

(d) **Demand on the Performance Bond:** With the Notice of Termination the Owner shall give the Surety a written demand that, upon the effective date of the Notice of Termination, the Surety promptly fulfill its obligation to take charge of and complete the Work in accordance with the terms of the Performance Bond.

(e) Surety Claims: Upon receiving the Owner's demand on the Performance Bond, the Surety shall assume all rights and obligations of the Contractor under the Contract. However, the Surety shall also have the right to assert "Surety Claims" to the Owner, which are defined as claims relating to acts or omissions of the Owner or Architect prior to termination of the Contractor which may have prejudiced its rights as Surety or its interest in the unpaid balance of the Contract Sum. If the Surety wishes to assert a Surety Claim, it shall give the Owner, through the Architect, written notice within twenty-one days after first recognizing the

condition giving rise to the Surety Claim. The Surety Claim shall then be submitted to the Owner, through the Architect, no later than sixty days after giving notice thereof, but no such Surety Claims shall be considered if submitted after the date upon which final payment becomes due. Final resolution of Surety Claims shall be pursuant to Article 24, Resolution of Claims and Disputes. The presence or possibility of a Surety Claim shall not be just cause for the Surety to fail or refuse to take charge of and complete the Work or for the Owner to fail or refuse to continue to make payments in accordance with the Contract Documents.

(f) Payments to Surety: The Surety shall be paid for completing the Work in accordance with the Contract Documents as if the Surety were the Contractor. The Owner shall have the right to deduct from payments to the Surety any reasonable costs incurred by the Owner, including compensation for additional architectural, engineering, managerial, and administrative services, and attorneys' fees as necessitated by termination of the Contractor and completion of the Work by the Surety. No further payments shall be made to the Contractor by the Owner. The Surety shall be solely responsible for any accounting to the Contractor for the portion of the Contract Sum paid to Surety by Owner or for the costs and expenses of completing the Work.

(4) Wrongful Termination: If any notice of termination by the Owner for cause, made in good faith, is determined to have been wrongly given, such termination shall be effective and compensation therefore determined as if it had been a termination for convenience pursuant to Paragraph B below.

B. <u>TERMINATION by the OWNER for CONVENIENCE</u>

(1) The Owner may, without cause and at any time, terminate the performance of Work under the Contract in whole, or in part, upon determination by the Owner that such termination is in the Owner's best interest. Such termination is referred to herein as Termination for Convenience.

(2) Upon receipt of a written notice of Termination for Convenience from the Owner, the Contractor shall:

(a) stop Work as specified in the notice;

(b) enter into no further subcontracts or purchase orders for materials, services, or facilities, except as may be necessary for Work directed to be performed prior to the effective date of the termination or to complete Work that is not terminated;

(c) terminate all existing subcontracts and purchase orders to the extent they relate to the terminated Work;

(d) take such actions as are necessary, or directed by the Architect or Owner, to protect, preserve, and make safe the terminated Work; and

(e) complete performance of the Work that is not terminated.

(3) In the event of Termination for Convenience, the Contractor shall be entitled to receive payment for the Work performed prior to its termination, including materials and equipment purchased and delivered for incorporation into the terminated Work, and any reasonable costs incurred because of the termination. Such payment shall include reasonable mark-up of costs for overhead and profit, not to exceed the limits stated in Article 19, Changes in the Work. The Contractor shall be entitled to receive payment for reasonable anticipated overhead ("home office") and shall not be entitled to receive payment for any profits anticipated to have been gained from the terminated Work. A proposal for decreasing the Contract Sum shall be submitted to the Architect by the Contractor in such time and detail, and with such supporting documentation, as is reasonable

directed by the Owner. Final modification of the Contract shall be by Contract Change Order pursuant to Article 19. Any Claim or Dispute involving the termination or any amount due a party as a result shall be resolved pursuant to Article 24.

ARTICLE 28 CONTRACTOR'S RIGHT to SUSPEND or TERMINATE the CONTRACT

A. <u>SUSPENSION by the OWNER</u>

If all of the Work is suspended or delayed for the Owner's convenience or under an order of any court, or other public authority, for a period of sixty days, through no act or fault of the Contractor or a Subcontractor, or anyone for whose acts they may be liable, then the Contractor may give the Owner a written Notice of Termination which allows the Owner fourteen days after receiving the Notice in which to give the Contractor appropriate written authorization to resume the Work. Absent the Contractor's receipt of such authorization to resume the Work, the Contract shall terminate upon expiration of this fourteen day period and the Contractor will be compensated by the Owner as if the termination had been for the Owner's convenience pursuant to Article 27.B.

B. <u>NONPAYMENT</u>

The Owner's failure to pay the undisputed amount of an Application for Payment within sixty days after receiving it from the Architect (Certified pursuant to Article 30) shall be just cause for the Contractor to give the Owner fourteen days' written notice that the Work will be suspended pending receipt of payment but that the Contract shall terminate if payment is not received within fourteen days (or a longer period stated by the Contractor) of the expiration of the fourteen day notice period.

(1) If the Work is then suspended for nonpayment, but resumed upon receipt of payment, the Contractor will be entitled to compensation as if the suspension had been by the Owner pursuant to Article 26, Paragraph B.

(2) If the Contract is then terminated for nonpayment, the Contractor will be entitled to compensation as if the termination had been by the Owner pursuant to Article 27, Paragraph B.

ARTICLE 29 PROGRESS PAYMENTS

A. FREQUENCY of PROGRESS PAYMENTS

Unless otherwise provided in the Contract Documents, the Owner will make payments to the Contractor as the Work progresses based on monthly estimates prepared and certified by the Contractor, approved and certified by the Architect, and approved by the Owner and other authorities whose approval is required.

B. <u>SCHEDULE of VALUES</u>

Within ten days after receiving the Notice to Proceed the Contractor shall submit to the Architect a

DCM Form C-10SOV, Schedule of Values, which is a breakdown of the Contract Sum showing the value of the various parts of the Work for billing purposes. The Schedule of Values shall be printable on $8.5^{"} \times 11^{"}$ for DCM's scanning purposes and shall divide the Contract Sum into as many parts ("line items") as the Architect and Owner determine necessary to permit evaluation and to show amounts attributable to Subcontractors. The Contractor's overhead and profit are to be proportionately distributed throughout the line items of the Schedule of Values. Upon approval, the Schedule of Values shall be used as a basis for monthly Applications for Payment, unless it is later found to be in error. Approved change order amounts shall be added to or incorporated into the Schedule of Values as mutually agreed by the Contractor and Architect.

C. <u>APPLICATIONS for PAYMENTS</u>

(1) Based on the approved Schedule of Values, each DCM Form C-10, Application and Certificate for Payment shall show the Contractor's estimate of the value of Work performed in each line item as of the end of the billing period. The Contractor's cost of materials and equipment not yet incorporated into the Work, but delivered and suitably stored on the site, may be considered in monthly Applications for Payment. One payment application per month may be submitted. Each DCM Form C-10, Application and Certificate for Payment shall match to the penny and be accompanied by an attached DCM Form C-10SOV, Schedule of Values.

(2) The Contractor's estimate of the value of Work performed and stored materials must represent such reasonableness as to warrant certification by the Architect to the Owner in accordance with Article 30. Each monthly Application for Payment shall be supported by such data as will substantiate the Contractor's right to payment, including without limitation copies of requisitions from subcontractors and material suppliers.

(3) If no other date is stated in the Contract Documents or agreed upon by the parties, each Application for Payment shall be submitted to the Architect on or about the first day of each month and payment shall be issued to the Contractor within thirty days after an Application for Payment is Certified pursuant to Article 30 and delivered to the Owner.

(4) Four copies of DCM Form C-10, Application and Certificate for Payment containing original signatures, with each copy of DCM Form C-10 to include all attachments, shall be submitted to DCM for review following the Contractor's, Notary's, Architect's and Owner's signatures.

D. MATERIALS STORED OFF SITE

Unless otherwise provided in the Contract Documents, the Contractor's cost of materials and equipment to be incorporated into the Work, which are stored off the site, may also be considered in monthly Applications for Payment under the following conditions:

- (1) the contractor has received written approval from the Architect and Owner to store the materials or equipment off site in advance of delivering the materials to the off site location;
- (2) a Certificate of Insurance is furnished to the Architect evidencing that a special insurance policy, or rider to an existing policy, has been obtained by the Contractor providing all-risk property insurance coverage, specifically naming the materials or equipment stored, and naming the Owner as an additionally insured party;
- (3) the Architect is provided with a detailed inventory of the stored materials or equipment and the materials or equipment are clearly marked in correlation to the inventory to facilitate inspection and verification of the presence of the materials or equipment by the Architect or

Owner;

- (4) the materials or equipment are properly and safely stored in a bonded warehouse, or a facility otherwise approved in advance by the Architect and Owner; and
- (5) compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest.

E. <u>RETAINAGE</u>

(1) "Retainage" is defined as the money earned and, therefore, belonging to the Contractor (subject to final settlement of the Contract) which has been retained by the Owner conditioned on final completion and acceptance of all Work required by the Contract Documents. Retainage shall not be relied upon by Contractor (or Surety) to cover or off-set unearned monies attributable to uncompleted or uncorrected Work.

(2) In making progress payments the Owner shall retain five percent of the estimated value of Work performed and the value of the materials stored for the Work when the Total Completed Work and Stored Materials is less than fifty percent of the Total Contract to date. Owner shall retain two and a half percent of the Total Contract to date after Total Completed Work and Stored Materials has reached fifty percent of the Total Contract to date. Retainage shall be released upon completion of all close-out requirements per Article 34 and the review, approval and processing of contractor's final Application for Payment.

F. <u>CONTRACTOR'S CERTIFICATION</u>

(1) Each Application for Payment shall bear the Contractor's notarized certification that, to the best of the Contractor's knowledge, information, and belief, the Work covered by the Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payments were issued and payments received from the Owner and that the current payment shown in the Application for Payment has not yet been received.

(2) By making this certification the Contractor represents to the Architect and Owner that, upon receipt of previous progress payments from the Owner, the Contractor has promptly paid each Subcontractor, in accordance with the terms of its agreement with the Subcontractor, the amount due the Subcontractor from the amount included in the progress payment on account of the Subcontractor's Work and stored materials. The Architect and Owner may advise Subcontractors and suppliers regarding percentages of completion or amounts requested and/or approved in an Application for Payment on account of the Subcontractor's Work and stored materials.

G. PAYMENT ESTABLISHES OWNERSHIP

All material and Work covered by progress payments shall become the sole property of the Owner, but the Contractor shall not be relieved from the sole responsibility for the care and protection of material and Work upon which payments have been made and for the restoration of any damaged material and Work.

ARTICLE 30 CERTIFICATION and APPROVALS for PAYMENT

- **A.** The Architect's review, approval, and certification of Applications for Payment shall be based on the Architect's general knowledge of the Work obtained through site visits and the information provided by the Contractor with the Application. The Architect shall not be required to perform exhaustive examinations, evaluations, or estimates of the cost of completed or uncompleted Work or stored materials to verify the accuracy of amounts requested by the Contractor, but the Architect shall have the authority to adjust the Contractor's estimate when, in the Architect's reasonable opinion, such estimates are overstated or understated.
- **B.** Within seven days after receiving the Contractor's monthly Application for Payment, or such other time as may be stated in the Contract Documents, the Architect will take one of the following actions:

(1) The Architect will approve and certify the Application as submitted and forward it to the Owner as a Certification for Payment for approval by the Owner (and other approving authorities, if any) and payment.

(2) If the Architect takes exception to any amounts claimed by the Contractor and the Contractor and Architect cannot agree on revised amounts, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to certify to the Owner, transmitting a copy of same to the Contractor.

(3) To the extent the Architect determines may be necessary to protect the Owner from loss on account of any of the causes stated in Article 31, the Architect may subtract from the Contractor's estimates and will issue a Certificate for Payment to the Owner, with a copy to the Contractor, for such amount as the Architect determines is properly due and notify the Contractor and Owner in writing of the Architect's reasons for withholding payment in whole or in part.

- **C.** Neither the Architect's issuance of a Certificate for Payment nor the Owner's resulting progress payment shall be a representation to the Contractor that the Work in progress or completed at that time is accepted or deemed to be in conformance with the Contract Documents.
- **D.** The Architect shall not be required to determine that the Contractor has promptly or fully paid Subcontractors and suppliers or how or for what purpose the Contractor has used monies paid under the Construction Contract. However, the Architect may, upon request and if practical, inform any Subcontractor or supplier of the amount, or percentage of completion, approved or paid to the Contractor on account of the materials supplied or the Work performed by the Subcontractor.

ARTICLE 31 PAYMENTS WITHHELD

- **A.** The Architect may nullify or revise a previously issued Certificate for Payment prior to Owner's payment thereunder to the extent as may be necessary in the Architect's opinion to protect the Owner from loss on account of any of the following causes not discovered or fully accounted for at the time of the certification or approval of the Application for Payment:
 - (1) Defective Work;

- (2) filed, or reasonable evidence indicating probable filing of, claims arising out of the Contract by other parties against the Contractor;
- (3) the Contractor's failure to pay for labor, materials or equipment or to pay Subcontractors;
- (4) reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- (5) damage suffered by the Owner or another contractor caused by the Contractor, a Subcontractor, or anyone for whose acts they may be liable;
- (6) reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance is insufficient to cover applicable liquidated damages; or
- (7) the Contractor's persistent failure to conform to the requirements of the Contract Documents.
- **B.** If the Owner deems it necessary to withhold payment pursuant to preceding Paragraph A, the Owner will notify the Contractor and Architect in writing of the amount to be withheld and the reason for same.
- **C.** The Architect shall not be required to withhold payment for completed or partially completed Work for which compliance with the Contract Documents remains to be determined by Specified Inspections or Final Inspections to be performed in their proper sequence. However, if Work for which payment has been approved, certified, or made under an Application for Payment is subsequently determined to be Defective Work, the Architect shall determine an appropriate amount that will protect the Owner's interest against the Defective Work.

(1) If payment has not been made against the Application for Payment first including the Defective Work, the Architect will notify the Owner and Contractor of the amount to be withheld from the payment until the Defective Work is brought into compliance with the Contract Documents.

(2) If payment has been made against the Application for Payment first including the Defective Work, the Architect will withhold the appropriate amount from the next Application for Payment submitted after the determination of noncompliance, such amount to then be withheld until the Defective Work is brought into compliance with the Contract Documents.

- **D.** The amount withheld will be paid with the next Application for Payment certified and approved after the condition for which the Owner has withheld payment is removed or otherwise resolved to the Owner's satisfaction.
- **E.** The Owner shall have the right to withhold from payments due the Contractor under this Contract an amount equal to any amount which the Contractor owes the Owner under another contract.

ARTICLE 32 SUBSTANTIAL COMPLETION

A. Substantial Completion is the stage in the progress of the Work when the Work or designated portion of the Work is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use without disruption or interference by the Contractor in completing or correcting any remaining unfinished Work ("punch list" items). Substantial Completion of the Work, or a designated portion of the Work, is not achieved until so agreed in a Certificate of Substantial Completion signed by the Contractor, Architect, Owner, and

Technical Staff of the Alabama Division of Construction Management.

- **B.** The Contractor shall notify the Architect in writing when it considers the Work, or a portion of the Work which the Owner has agreed to accept separately, to be substantially complete and ready for a Final Inspection pursuant to Article 16. In this notification the Contractor shall identify any items remaining to be completed or corrected for Final Acceptance prior to final payment.
- **C.** Substantial Completion is achieved and a Final Inspection is appropriate only when a minimal number of punch list items exists and only a short period of time will be required to correct or complete them. Upon receipt of the Contractor's notice for a Final Inspection, the Architect will advise the Contractor in writing of any conditions of the Work which the Architect or Owner is aware do not constitute Substantial Completion, otherwise, a Final Inspection will proceed within a reasonable time after the Contractor's notice is given. However, the Architect will not be required to prepare lengthy listings of punch list items; therefore, if the Final Inspection discloses that Substantial Completion has not been achieved, the Architect may discontinue or suspend the inspection until the Contractor does achieve Substantial Completion.

D. <u>CERTIFICATE of SUBSTANTIAL COMPLETION</u>

(1) When the Work or a designated portion of the Work is substantially complete, the Architect will prepare and sign a Certificate of Substantial Completion to be signed in order by the Contractor, Owner, and Alabama Division of Construction Management.

(2) When signed by all parties, the Certificate of Substantial Completion shall establish the Date of Substantial Completion which is the date upon which:

(a) the Work, or designated portion of the Work, is accepted by the Architect, Owner, and Alabama Division of Construction Management as being ready for occupancy,

(b) the Contractor's one-year and special warranties for the Work covered by the Certificate commence, unless stated otherwise in the Certificate (the one-year warranty for punch list items completed or corrected after the period allowed in the Certificate shall commence on the date of their Final Acceptance), and

(c) Owner becomes responsible for building security, maintenance, utility services, and insurance, unless stated otherwise in the Certificate.

(3) The Certificate of Substantial Completion shall set the time within which the Contractor shall finish all items on the "punch list" accompanying the Certificate. The completion of punch list items shall be a condition precedent to Final Payment.

(4) If the Work or designated portion covered by a Certificate of Substantial Completion includes roofing work, the General Contractor's (5-year) Roofing Guarantee, DCM Form C-9, must be executed by the Contractor and attached to the Certificate of Substantial Completion. If the Contract Documents specify any other roofing warranties to be provided by the roofing manufacturer, Subcontractor, or Contractor, they must also be attached to the Certificate of Substantial Completion. The Alabama Division of Construction Management will not sign the Certificate of Substantial Completion in the absence of the roofing guarantees.

E. The Date of Substantial Completion of the Work, as set in the Certificate of Substantial Completion of the Work or of the last completed portion of the Work, establishes the extent to which the Contractor is liable for Liquidated Damages, if any; however, should the Contractor fail to complete

all punch list items within thirty days, or such other time as may be stated in the respective Certificate of Substantial Completion, the Contractor shall bear any expenses, including additional Architectural services and expenses, incurred by the Owner as a result of such failure to complete punch list items in a timely manner.

ARTICLE 33 OCCUPANCY or USE PRIOR to COMPLETION

A. <u>UPON SUBSTANTIAL COMPLETION</u>

Prior to completion of the entire Work, the Owner may occupy or begin utilizing any designated portion of the Work on the agreed Date of Substantial Completion of that portion of the Work.

B. <u>BEFORE SUBSTANTIAL COMPLETION</u>

(1) The Owner shall not occupy or utilize any portion of the Work before Substantial Completion of that portion has been achieved.

(2) The Owner may deliver furniture and equipment and store, or install it in place ready for occupancy and use, in any designated portion of the Work before it is substantially completed under the following conditions:

(a) The Owner's storage or installation of furniture and equipment will not unreasonably disrupt or interfere with the Contractor's completion of the designated portion of the Work.

(b) The Contractor consents to the Owner's planned action (such consent shall not be unreasonably withheld).

(c) The Owner shall be responsible for insurance coverage of the Owner's furniture and equipment, and the Contractor's liability shall not be increased.

(d) The Contractor, Architect, and Owner will jointly inspect and record the condition of the Work in the area before the Owner delivers and stores or installs furniture and equipment; the Owner will equitably compensate the Contractor for making any repairs to the Work that may subsequently be required due to the Owner's delivery and storage or installation of furniture and equipment.

(e) The Owner's delivery and storage or installation of furniture and equipment shall not be deemed an acceptance of any Work not completed in accordance with the requirements of the Contract Documents.

ARTICLE 34 FINAL PAYMENT

A. <u>PREREQUISITES to FINAL PAYMENT</u>

The following conditions are prerequisites to Final Payment becoming due the Contractor:

- (1) Full execution of a Certificate of Substantial Completion for the Work, or each designated portion of the Work.
- (2) Final Acceptance of the Work.
- (3) The Contractor's completion, to the satisfaction of the Architect and Owner, of all documentary requirements of the Contract Documents; such as delivery of "as-built" documents, operating and maintenance manuals, warranties, etc.

- (4) Delivery to the Owner of a final Application for Payment, prepared by the Contractor and approved and certified by the Architect. Architect prepares DCM Form B-13: Final Payment Checklist and forwards it to the Owner along with the final Application for Payment.
- (5) Completion of an Advertisement for Completion pursuant to Paragraph C below.
- (6) Delivery by the Contractor to the Owner through the Architect of a Release of Claims and such other documents as may be required by Owner, satisfactory in form to the Owner pursuant to Paragraph D below.
- (7) Consent of Surety to Final Payment, if any, to Contractor. This Consent of Surety is required for projects which have Payment and Performance Bonds.
- (8) Delivery by the Contractor to the Architect and Owner of other documents, if any, required by the Contract Documents as prerequisites to Final Payment.

B. FINAL ACCEPTANCE of the WORK

"Final Acceptance of the Work" shall be achieved when all "punch list" items recorded with the Certificate(s) of Substantial Completion are accounted for by either: (1) their completion or correction by the Contractor and acceptance by the Architect, Owner, and DCM Project Inspector, or (2) their resolution under Article 18, Deductions for Uncorrected Work.

C. ADVERTISEMENT for COMPLETION

(1) If the Contract Sum is \$50,000 or less: The Owner, immediately after being notified by the Architect that all other requirements of the Contract have been completed, shall give public notice of completion of the Contract by having an Advertisement for Completion published one time in a newspaper of general circulation, published in the county in which the Owner is located for one week, and shall require the Contractor to certify under oath that all bills have been paid in full. Final payment may be made at any time after the notice has been posted for one entire week.

(2) If the Contract Sum is more than \$50,000: The Contractor, immediately after being notified by the Architect that all other requirements of the Contract have been completed, shall give public notice of completion of the Contract by having an Advertisement for Completion, similar to the sample contained in the Project Manual, published for a period of four successive weeks in some newspaper of general circulation published within the city or county where the Work was performed. Proof of publication of the Advertisement for Completion shall be made by the Contractor to the Architect by affidavit of the publisher, in duplicate, and a printed copy of the Advertisement for Completion published, in duplicate. If no newspaper is published in the county where the work was done, the notice may be given by posting at the Court House for thirty days and proof of same made by Probate Judge or Sheriff and the Contractor. Final payment shall not be due until thirty days after this public notice is completed.

D. <u>RELEASE of CLAIMS</u>

The Release of Claims and other documents referenced in Paragraph A(6) above are as follows:

(1) A release executed by Contractor of all claims and claims of lien against the Owner arising under and by virtue of the Contract, other than such claims of the Contractor, if any, as may have been previously made in writing and as may be specifically excepted by the Contractor from the operation of the release in stated amounts to be set forth therein.

(2) An affidavit under oath, if required, stating that so far as the Contractor has knowledge or Page 37 of 54

information, there are no claims or claims of lien which have been or will be filed by any Subcontractor, Supplier or other party for labor or material for which a claim or claim of lien could be filed.

(3) A release, if required, of all claims and claims of lien made by any Subcontractor, Supplier or other party against the Owner or unpaid Contract funds held by the Owner arising under or related to the Work on the Project; provided, however, that if any Subcontractor, Supplier or others refuse to furnish a release of such claims or claims of lien, the Contractor may furnish a bond executed by Contractor and its Surety to the Owner to provide an unconditional obligation to defend, indemnify and hold harmless the Owner against any loss, cost or expense, including attorney's fees, arising out of or as a result of such claims, or claims of lien, in which event Owner may make Final Payment notwithstanding such claims or claims of lien. If Contractor and Surety fail to fulfill their obligations to Owner under the bond, the Owner shall be entitled to recover damages as a result of such failure, including all costs and reasonable attorney's fees incurred to recover such damages.

E. <u>EFFECT of FINAL PAYMENT</u>

(1) The making of Final Payment shall constitute a waiver of Claims by the Owner except those arising from:

- (a) liens, claims, security interests or encumbrances arising out of the Contract and unsettled;
- (b) failure of the Work to comply with the requirements of the Contract Documents;
- (c) terms of warranties or indemnities required by the Contract Documents, or
- (d) latent defects.

(2) Acceptance of Final Payment by the Contractor shall constitute a waiver of claims by Contractor except those previously made in writing, identified by Contractor as unsettled at the time of final Application for Payment, and specifically excepted from the release provided for in Paragraph D(1), above.

ARTICLE 35 CONTRACTOR'S WARRANTY

A. <u>GENERAL WARRANTY</u>

The Contractor warrants to the Owner and Architect that all materials and equipment furnished under the Contract will be of good quality and new, except such materials as may be expressly provided or allowed in the Contract Documents to be otherwise, and that none of the Work will be Defective Work as defined in Article 1.

B. <u>ONE-YEAR WARRANTY</u>

(1) If, within one year after the date of Substantial Completion of the Work or each designated portion of the Work (or otherwise as agreed upon in a mutually-executed Certificate of Substantial Completion), any of the Work is found to be Defective Work, the Contractor shall promptly upon receipt of written notice from the Owner or Architect, and without expense to either, replace or correct the Defective Work to conform to the requirements of the Contract Documents, and repair all damage to the site, the building and its contents which is the result of Defective Work or its replacement or correction.
(2) The one-year warranty for punch list items shall begin on the Date of Substantial Completion if they are completed or corrected within the time period allowed in the Certificate of Substantial Completion in which they are recorded. The one-year warranty for punch list items that are not completed or corrected within the time period allowed in the Certificate of Substantial Completion, and other Work performed after Substantial Completion, shall begin on the date of Final Acceptance of the Work. The Contractor's correction of Work pursuant to this warranty does not extend the period of the warranty. The Contractor's one-year warranty does not apply to defects or damages due to improper or insufficient maintenance, improper operation, or wear and tear during normal usage.

(3) Upon recognizing a condition of Defective Work, the Owner shall promptly notify the Contractor of the condition. If the condition is causing damage to the building, its contents, equipment, or site, the Owner shall take reasonable actions to mitigate the damage or its continuation, if practical. If the Contractor fails to proceed promptly to comply with the terms of the warranty, or to provide the Owner with satisfactory written verification that positive action is in process, the Owner may have the Defective Work replaced or corrected and the Contractor and the Contractor's Surety shall be liable for all expense incurred.

(4) Year-end Inspection(s): An inspection of the Work, or each separately completed portion thereof, is required near the end of the Contractor's one-year warranty period(s). The inspection must be scheduled with the Owner, Architect and DCM Inspector. The subsequent delivery of the Architect's report of a Year-end Inspection will serve as confirmation that the Contractor was notified of Defective Work found within the warranty period.

(5) The Contractor's warranty of one year is in addition to, and not a limitation of, any other remedy stated herein or available to the Owner under applicable law.

C. <u>GENERAL CONTRACTOR'S ROOFING GUARANTEE</u>

(1) In addition to any other roof related warranties or guarantees that may be specified in the Contract Documents, the roof and associated work shall be guaranteed by the General Contractor against leaks and defects of materials and workmanship for a period of five (5) years, starting on the Date of Substantial Completion of the Project as stated in the Certificate of Substantial Completion. This guarantee for punch list items shall begin on the Date of Substantial Completion if they are completed or corrected within the time period allowed in the Certificate of Substantial Completion in which they are recorded. The guarantee for punch list items that are not completed or corrected within the time period allowed in the Certificate of Substantial begin on the date of Final Acceptance of the Work.

(2) The "General Contractor's Roofing Guarantee" (DCM Form C-9), included in the Project Manual, shall be executed in triplicate, signed by the appropriate party and submitted to the Architect for submission with the Certificate of Substantial Completion to the Owner and the Division of Construction Management.

(3) This guarantee does not include costs which might be incurred by the General Contractor in making visits to the site requested by the Owner regarding roof problems that are due to lack of proper maintenance (keeping roof drains and/or gutters clear of debris that cause a stoppage of drainage which results in water ponding, overflowing of flashing, etc.), or damages caused by vandalism or misuse of roof areas. Should the contractor be required to return to the job to correct problems of this nature that are determined not to be related to faulty workmanship and materials in

the installation of the roof, payment for actions taken by the Contractor in response to such request will be the responsibility of the Owner. A detailed written report shall be made by the General Contractor on each of these 'Service Calls' with copies to the Architect, Owner and Division of Construction Management.

D. SPECIAL WARRANTIES

(1) The Contractor shall deliver to the Owner through the Architect all special or extended warranties required by the Contract Documents from the Contractor, Subcontractors, and suppliers.

(2) The Contractor and the Contractor's Surety shall be liable to the Owner for such special warranties during the Contractor's one-year warranty; thereafter, the Contractor's obligations relative to such special warranties shall be to provide reasonable assistance to the Owner in their enforcement.

E. ASSUMPTION of GUARANTEES of OTHERS

If the Contractor disturbs, alters, or damages any work guaranteed under a separate contract, thereby voiding the guarantee of that work, the Contractor shall restore the work to a condition satisfactory to the Owner and shall also guarantee it to the same extent that it was guaranteed under the separate contract.

ARTICLE 36 INDEMNIFICATION AGREEMENT

To the fullest extent permitted by law, the Contractor shall defend, indemnify, and hold harmless the Owner, Architect, Architect's consultants, Alabama Division of Construction Management, State Department of Education (if applicable), and their agents, employees, and consultants (hereinafter collectively referred to as the "Indemnitees") from and against all claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of, related to, or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property, including loss of use resulting therefrom, and is caused in whole or in part by negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether such claim, damage, loss or expense is caused in part, or is alleged but not legally established to have been caused in whole or in part by the negligence or other fault of a party indemnified hereunder.

- **A.** This indemnification shall extend to all claims, damages, losses and expenses for injury or damage to adjacent or neighboring property, or persons injured thereon, that arise out of, relate to, or result from performance of the Work.
- **B.** This indemnification does not extend to the liability of the Architect, or the Architect's Consultants, agents, or employees, arising out of (1) the preparation or approval of maps, shop drawings, opinions, reports, surveys, field orders, Change Orders, drawings or specifications, or (2) the giving of or the failure to give directions or instructions, provided such giving or failure to give instructions is the primary cause of the injury or damage.
- C. This indemnification does not apply to the extent of the sole negligence of the Indemnitees.

ARTICLE 37 CONTRACTOR'S and SUBCONTRACTORS' INSURANCE

(Provide entire Article 37 to Contractor's insurance representative.)

A. <u>GENERAL</u>

(1) **RESPONSIBILITY.** The Contractor shall be responsible to the Owner from the time of the signing of the Construction Contract or from the beginning of the first work, whichever shall be earlier, for all injury or damage of any kind resulting from any negligent act or omission or breach, failure or other default regarding the work by the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of who may be the owner of the property.

(2) **INSURANCE PROVIDERS.** Each of the insurance coverages required below shall be issued by an insurer licensed by the Insurance Commissioner to transact the business of insurance in the State of Alabama for the applicable line of insurance, and such insurer (or, for qualified self-insureds or group self-insureds, a specific excess insurer providing statutory limits) must have a Best Policyholders Rating of "A-" or better and a financial size rating of Class V or larger.

(3) NOTIFICATION ENDORSEMENT. Each policy shall be endorsed to provide that the insurance company agrees that the policy shall not be canceled, changed, allowed to lapse or allowed to expire for any reason until thirty days after the Owner has received written notice by certified mail as evidenced by return receipt or until such time as other insurance coverage providing protection equal to protection called for in the Contract Documents shall have been received, accepted and acknowledged by the Owner. Such notice shall be valid only as to the Project as shall have been designated by Project Name and Number in said notice.

(4) **INSURANCE CERTIFICATES.** The Contractor shall procure the insurance coverages identified below, or as otherwise required in the Contract Documents, at the Contractor's own expense, and to evidence that such insurance coverages are in effect, the Contractor shall furnish the Owner an insurance certificate(s) acceptable to the Owner and listing the Owner as the certificate holder. The insurance certificate(s) must be delivered to the Owner with the Construction Contract and Bonds for final approval and execution of the Construction Contract. The insurance certificate must provide the following:

- (a) Name and address of authorized agent of the insurance company
- (b) Name and address of insured
- (c) Name of insurance company or companies
- (d) Description of policies
- (e) Policy Number(s)
- (**f**) Policy Period(s)
- (g) Limits of liability
- (h) Name and address of Owner as certificate holder
- (i) Project Name and Number, if any
- (j) Signature of authorized agent of the insurance company
- (k) Telephone number of authorized agent of the insurance company
- (I) Mandatory thirty day notice of cancellation / non-renewal / change

(5) MAXIMUM DEDUCTIBLE. Self-insured retention, except for qualified self-insurers or group self-insurers, in any policy shall not exceed \$25,000.00.

B. <u>INSURANCE COVERAGES</u>

Unless otherwise provided in the Contract Documents, the Contractor shall purchase the types of insurance coverages with liability limits not less than as follows:

(1) WORKERS' COMPENSATION and EMPLOYER'S LIABILITY INSURANCE

(a) Workers' Compensation coverage shall be provided in accordance with the statutory coverage required in Alabama. A group insurer must submit a certificate of authority from the Alabama Department of Industrial Relations approving the group insurance plan. A self-insurer must submit a certificate from the Alabama Department of Industrial Relations stating the Contractor qualifies to pay its own workers' compensation claims.

- (b) Employer's Liability Insurance limits shall be at least:
 - .1 Bodily Injury by Accident \$1,000,000 each accident
 - .2 Bodily Injury by Disease \$1,000,000 each employee

(2) COMMERCIAL GENERAL LIABILITY INSURANCE

(a) Commercial General Liability Insurance, written on an ISO Occurrence Form (current edition as of the date of Advertisement for Bids) or equivalent, shall include, but need not be limited to, coverage for bodily injury and property damage arising from premises and operations liability, products and completed operations liability, blasting and explosion, collapse of structures, underground damage, personal injury liability and contractual liability. The Commercial General Liability Insurance shall provide at minimum the following limits:

Coverage

- .1 General Aggregate
- .2 Products, Completed Operations Aggregate
- .3 Personal and Advertising Injury
- .4 Each Occurrence

Limit \$ 2,000,000.00 per Project \$ 2,000,000.00 per Project \$ 1,000,000.00 per Occurrence \$ 1,000,000.00

(b) Additional Requirements for Commercial General Liability Insurance:

.1 The policy shall name the Owner, Architect, Alabama Division of Construction Management, State Department of Education (if applicable), and their agents, consultants and employees as additional insureds, state that this coverage shall be primary insurance for the additional insureds; and contain no exclusions of the additional insureds relative to job accidents.

.2 The policy must include separate per project aggregate limits.

(3) COMMERCIAL BUSINESS AUTOMOBILE LIABILITY INSURANCE

(a) Commercial Business Automobile Liability Insurance which shall include coverage for bodily injury and property damage arising from the operation of any owned, non-owned or hired automobile. The Commercial Business Automobile Liability Insurance Policy shall provide not less than \$1,000,000 Combined Single Limits for each occurrence.

(b) The policy shall name the Owner, Architect, Alabama Division of Construction Management, State Department of Education (if applicable), and their agents, consultants, and employees as additional insureds.

(4) COMMERCIAL UMBRELLA LIABILITY INSURANCE

(a) Commercial Umbrella Liability Insurance to provide excess coverage above the Commercial General Liability, Commercial Business Automobile Liability and the Workers' Compensation and Employer's Liability to satisfy the minimum limits set forth herein.

(b) Minimum <u>Combined</u> Primary Commercial General Liability and Commercial/Excess Umbrella Limits of:

- **.1** \$ 5,000,000 per Occurrence
- **.2** \$ 5,000,000 Aggregate
- (c) Additional Requirements for Commercial Umbrella Liability Insurance:

.1 The policy shall name the Owner, Architect, Alabama Division of Construction Management, State Department of Education (if applicable), and their agents, consultants, and employees as additional insureds.

.2 The policy must be on an "occurrence" basis.

(5) **BUILDER'S RISK INSURANCE**

(a) The Builder's Risk Policy shall be made payable to the Owner and Contractor, as their interests may appear. The policy amount shall be equal to 100% of the Contract Sum, written on a Causes of Loss - Special Form (current edition as of the date of Advertisement for Bids), or its equivalent. All deductibles shall be the sole responsibility of the Contractor.

(b) The policy shall be endorsed as follows:

"The following may occur without diminishing, changing, altering or otherwise affecting the coverage and protection afforded the insured under this policy:

(i) Furniture and equipment may be delivered to the insured premises and installed in place ready for use; or

(ii) Partial or complete occupancy by Owner; or

(iii) Performance of work in connection with construction operations insured by the Owner, by agents or lessees or other contractors of the Owner, or by contractors of the lessee of the Owner."

C. <u>SUBCONTRACTORS' INSURANCE</u>

(1) WORKERS' COMPENSATION and EMPLOYER'S LIABILITY INSURANCE. The Contractor shall require each Subcontractor to obtain and maintain Workers' Compensation and Employer's Liability Insurance coverages as described in preceding Paragraph B, or to be covered by the Contractor's Workers' Compensation and Employer's Liability Insurance while performing Work under the Contract.

(2) LIABILITY INSURANCE. The Contractor shall require each Subcontractor to obtain and maintain adequate General Liability, Automobile Liability, and Umbrella Liability Insurance coverages similar to those described in preceding Paragraph B. Such coverage shall be in effect at all times that a Subcontractor is performing Work under the Contract.

(3) **ENFORCEMENT RESPONSIBILITY.** The Contractor shall have responsibility to enforce its Subcontractors' compliance with these or similar insurance requirements; however, the Contractor shall, upon request, provide the Architect or Owner acceptable evidence of insurance for any Subcontractor.

D. <u>TERMINATION of OBLIGATION to INSURE</u>

Unless otherwise expressly provided in the Contract Documents, the obligation to insure as provided herein shall continue as follows:

(1) **BUILDER'S RISK INSURANCE.** The obligation to insure under Subparagraph B(5) shall remain in effect until the Date of Substantial Completion as shall be established in the Certificate of Substantial Completion. In the event that multiple Certificates of Substantial Completion covering designated portions of the Work are issued, Builder's Risk coverage shall remain in effect until the Date of Substantial Completion as shall be established in the last issued Certificate of Substantial Completion. However, in the case that the Work involves separate buildings, Builder's Risk coverage of each separate building may terminate on the Date of Substantial Completion as established in the Certificate of Substantial Completion as

(2) **PRODUCTS and COMPLETED OPERATIONS.** The obligation to carry Products and Completed Operations coverage specified under Subparagraph B(2) shall remain in effect for two years after the Date(s) of Substantial Completion.

(3) ALL OTHER INSURANCE. The obligation to carry other insurance coverages specified under Subparagraphs B(1) through B(4) and Paragraph C shall remain in effect after the Date(s) of Substantial Completion until such time as all Work required by the Contract Documents is completed. Equal or similar insurance coverages shall remain in effect if, after completion of the Work, the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, returns to the Project to perform warranty or maintenance work pursuant to the terms of the Contract Documents.

E. WAIVERS of SUBROGATION

The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors performing construction or operations related to the Project, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss. But said waiver shall apply only to the extent the loss or damage is covered by builder's risk insurance applicable to the Work or to other property located within or adjacent to the Project, except such rights as they may have to proceeds of such insurance held by the Owner or Contractor as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors, if any, and the subcontractor, subsubcontractors, suppliers, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The Policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to the person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged. The waivers provided for in this paragraph shall not be applicable to loss or damage that occurs after final acceptance of the Work.

ARTICLE 38 PERFORMANCE and PAYMENT BONDS

A. <u>GENERAL</u>

Upon signing and returning the Construction Contract to the Owner for final approval and execution, the Contractor shall, at the Contractor's expense, furnish to the Owner a Performance Bond and a Payment Bond (P&P Bonds), DCM Forms C-6 and C-7 as contained in the Project Manual, each in a penal sum equal to 100% of the Contract Sum. Each bond shall be on the form contained in the Project Manual, shall be executed by a surety company (Surety) acceptable to the Owner and duly authorized and qualified to make such bonds in the State of Alabama in the required amount. There shall be six original P&P Bonds submitted with original signatures for each of the six contracts required. The P&P bonds must be signed either on the same day or after the construction contract date. Each P&P Bond shall have attached thereto an original power of attorney (POA) of the signing official. The POA signature date must be the same day as the P&P Bond's signature date. All signatures must be present.

The provisions of this Article are not applicable to this Contract if the Contract Sum is less than \$50,000, unless bonds are required for this Contract in the Supplemental General Conditions.

B. <u>PERFORMANCE BOND</u>

Through the Performance Bond, the Surety's obligation to the Owner shall be to assure the prompt and faithful performance of the Contract and Contract Change Orders. The Penal Sum shall remain equal to the Contract Sum as the Contract Sum is adjusted by Contract Change Orders. In case of default on the part of the Contractor, the Surety shall take charge of and complete the Work in accordance with the terms of the Performance Bond. Any reasonable expenses incurred by the Owner as a result of default on the part of the Contractor, including architectural, engineering, administrative, and legal services, shall be recoverable under the Performance Bond.

C. PAYMENT BOND

Through the Payment Bond the Surety's obligation to the Owner shall be to guarantee that the Contractor and its Subcontractors shall promptly make payment to all persons supplying labor, materials, or supplies for, or in, the prosecution of the Work, including the payment of reasonable attorneys fees incurred by successful claimants or plaintiffs in civil actions on the Bond. Any person or entity indicating that they have a claim of nonpayment under the Bond shall, upon written request, be promptly furnished a certified copy of the Bond and Construction Contract by the Contractor, Architect, Owner, or Alabama Division of Construction Management, whomever is recipient of the request.

D. <u>CHANGE ORDERS</u>

The Penal Sum shall remain equal to the Contract Sum as the Contract Sum is adjusted by Contract Change Orders. All Contract Change Orders involving an increase in the Contract Sum will require consent of Surety by endorsement of the Contract Change Order form. The Surety waives notification of any Contract Change Orders involving only extension of the Contract Time.

E. <u>EXPIRATION</u>

The obligations of the Contractor's performance bond surety shall be coextensive with the contractor's performance obligations under the Contract Documents; provided, however, that the surety's obligation shall expire at the end of the one-year warranty period(s) of Article 35.

ARTICLE 39 ASSIGNMENT

The Contractor shall not assign the Contract or sublet it as a whole nor assign any moneys due or to become due to the Contractor thereunder without the previous written consent of the Owner (and of the Surety, in the case of a bonded Construction Contract). As prescribed by the Public Works Law, the Contract shall in no event be assigned to an unsuccessful bidder for the Contract whose bid was rejected because the bidder was not a responsible or responsive bidder.

ARTICLE 40 CONSTRUCTION by OWNER or SEPARATE CONTRACTORS

A. <u>OWNER'S RESERVATION of RIGHT</u>

(1) The Owner reserves the right to self-perform, or to award separate contracts for, other portions of the Project and other Project related construction and operations on the site. The contractual conditions of such separate contracts shall be substantially similar to those of this Contract, including insurance requirements and the provisions of this Article. If the Contractor considers such actions to involve delay or additional cost under this Contract, notifications and assertion of claims shall be as provided in Article 20 and Article 23.

(2) When separate contracts are awarded, the term "Contractor" in the separate Contract Documents shall mean the Contractor who executes the respective Construction Contract.

B. <u>COORDINATION</u>

Unless otherwise provided in the Contract Documents, the Owner shall be responsible for coordinating the activities of the Owner's forces and separate contractors with the Work of the Contractor. The Contractor shall cooperate with the Owner and separate contractors, shall participate in reviewing and comparing their construction schedules relative to that of the Contractor when directed to do so, and shall make and adhere to any revisions to the construction schedule resulting from a joint review and mutual agreement.

C. CONDITIONS APPLICABLE to WORK PERFORMED by OWNER

Unless otherwise provided in the Contract Documents, when the Owner self-performs construction or operations related to the Project, the Owner shall be subject to the same obligations to Contractor as Contractor would have to a separate contractor under the provision of this Article 40.

D. MUTUAL RESPONSIBILITY

(1) The Contractor shall reasonably accommodate the required introduction and storage of materials and equipment and performance of activities by the Owner and separate contractors and shall connect and coordinate the Contractor's Work with theirs as required by the Contract Documents.

(2) By proceeding with an element or portion of the Work that is applied to or performed on construction by the Owner or a separate contractor, or which relies upon their operations, the Contractor accepts the condition of such construction or operations as being suitable for the Contractor's Work, except for conditions that are not reasonably discoverable by the Contractor. If the Contractor discovers any condition in such construction or operations that is not suitable for the proper performance of the Work, the Contractor shall not proceed, but shall instead promptly notify the Architect in writing of the condition discovered.

(3) The Contractor shall reimburse the Owner for any costs incurred by a separate contractor and payable by the Owner because of acts or omissions of the Contractor. Likewise, the Owner shall be responsible to the Contractor for any costs incurred by the Contractor because of the acts or omissions of a separate contractor.

(4) The Contractor shall not cut or otherwise alter construction by the Owner or a separate contractor without the written consent of the Owner and separate contractor; such consent shall not be unreasonably withheld. Likewise, the Contractor shall not unreasonably withhold its consent allowing the Owner or a separate contractor to cut or otherwise alter the Work.

(5) The Contractor shall promptly remedy any damage caused by the Contractor to the construction or property of the Owner or separate contractors.

ARTICLE 41 SUBCONTRACTS

A. <u>AWARD of SUBCONTRACTS and OTHER CONTRACTS for PORTIONS of the WORK</u>

(1) Unless otherwise provided in the Contract Documents, when delivering the executed Construction Contract, bonds, and evidence of insurance to the Architect, the Contractor shall also submit a listing of Subcontractors proposed for each principal portion of the Work and fabricators or suppliers proposed for furnishing materials or equipment fabricated to the design of the Contract Documents. This listing shall be in addition to any naming of Subcontractors, fabricators, or suppliers that may have been required in the bid process. The Architect will promptly reply to the Contractor in writing stating whether or not the Owner, after due investigation, has reasonable objection to any Subcontractor, fabricator, or supplier proposed by the Contractor. The issuance of the Notice to Proceed in the absence of such objection by the Owner shall constitute notice that no reasonable objection to them is made.

(2) The Contractor shall not contract with a proposed Subcontractor, fabricator, or supplier to whom the Owner has made reasonable and timely objection. Except in accordance with prequalification procedures as may be contained in the Contract Documents, through specified qualifications, or on the grounds of reasonable objection, the Owner may not restrict the Contractor's selection of Subcontractors, fabricators, or suppliers.

(3) Upon the Owner's reasonable objection to a proposed Subcontractor, fabricator, or supplier, the Contractor shall promptly propose another to whom the Owner has no reasonable objection. If the proposed Subcontractor, fabricator, or supplier to whom the Owner made reasonable objection was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be equitably adjusted by Contract Change Order for any resulting difference if the Contractor has acted promptly and responsively in this procedure.

(4) The Contractor shall not change previously selected Subcontractors, fabricators, or suppliers without notifying the Architect and Owner in writing of proposed substitute Subcontractors, fabricators, or suppliers. If the Owner does not make a reasonable objection to a proposed substitute within three working days, the substitute shall be deemed approved.

B. <u>SUBCONTRACTUAL RELATIONS</u>

(1) The Contractor agrees to bind every Subcontractor and material supplier (and require every Subcontractor to so bind its subcontractors and material suppliers) to all the provisions of the Contract Documents as they apply to the Subcontractor's and material supplier's portion of the Work.

(2) Nothing contained in the Contract Documents shall be construed as creating any contractual relationship between any Subcontractor and the Owner, nor to create a duty of the Architect, Owner, or Director to resolve disputes between or among the Contractor or its Subcontractors and suppliers or any other duty to such Subcontractors or suppliers.

ARTICLE 42 ARCHITECT'S STATUS

- A. The Architect is an independent contractor performing, with respect to this Contract, pursuant to an agreement executed between the Owner and the Architect. The Architect has prepared the Drawings and Specifications and assembled the Contract Document and is, therefore, charged with their interpretation and clarification as described in the Contract Documents. As a representative of the Owner, the Architect will endeavor to guard the Owner against variances from the requirements of the Contract Documents by the Contractor. On behalf of the Owner, the Architect will administer the Contract as described in the Contract Documents during construction and the Contractor's one-year warranty.
- **B.** So as to maintain continuity in administration of the Contract and performance of the Work, and to facilitate complete documentation of the project record, all communications between the Contractor and Owner regarding matters of or related to the Contract shall be directed through the Architect, unless direct communication is otherwise required to provide a legal notification. Unless otherwise authorized by the Architect, communications by and with the Architect's consultants shall be through the Architect. Unless otherwise authorized by the Contractor, communications by and with Subcontractors and material suppliers shall be through the Contractor.

C. ARCHITECT'S AUTHORITY

Subject to other provisions of the Contract Documents, the following summarizes some of the authority vested in the Architect by the Owner with respect to the Construction Contract and as further described or conditioned in other Articles of these General Conditions of the Contract.

(1) The Architect is authorized to:

- (a) approve "minor" deviations as defined in Article 9, Submittals,
- (b) make "minor" changes in the Work as defined in Article 19, Changes in the Work,
- (c) reject or require the correction of Defective Work,
- (d) require the Contractor to stop the performance of Defective Work,

(e) adjust an Application for Payment by the Contractor pursuant to Article 30, Certification and Approval of payments, and

(f) issue Notices to Cure pursuant to Article 27.

(2) The Architect is not authorized to:

(a) revoke, alter, relax, or waive any requirements of the Contract Documents (other than "minor" deviations and changes) without concurrence of the Owner,

- (b) finally approve or accept any portion of the Work without concurrence of the Owner,
- (c) issue instructions contrary to the Contract Documents,
- (d) issue Notice of Termination or otherwise terminate the Contract, or

(e) require the Contractor to stop the Work except only to avoid the performance of Defective Work.

D. <u>LIMITATIONS of RESPONSIBILITIES</u>

(1) The Architect shall not be responsible to Contractors or to others for supervising or coordinating the performance of the Work or for the Construction Methods or safety of the Work, unless the Contract Documents give other specific instructions concerning these matters.

(2) The Architect will not be responsible to the Contractor (nor the Owner) for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents or for acts or omissions of the Contractor, a Subcontractor, or anyone for whose acts they may be liable. However, the Architect will report to the Owner and Contractor any Defective Work recognized by the Architect.

(3) The Architect will endeavor to secure faithful performance by Owner and Contractor, and the Architect will not show partiality to either or be liable to either for results of interpretations or decisions rendered in good faith.

(4) The Contractor's remedies for additional time or expense arising out of or related to this Contract, or the breach thereof, shall be solely as provided for in the Contract Documents. The Contractor shall have no claim or cause of action against the Owner, Architect, or its consultants for any actions or failures to act, whether such claim may be in contract, tort, strict liability, or otherwise, it being the agreement of the parties that the Contractor shall make no claim against the Owner or any agents of the Owner, including the Architect or its consultants, except as may be provided for claims or disputes submitted in accordance with Article 24. The Architect and Architect's consultants shall be considered third party beneficiaries of this provision of the Contract and entitled to enforce same.

E. <u>ARCHITECT'S DECISIONS</u>

Decisions by the Architect shall be in writing The Architect's decisions on matters relating to aesthetic effect will be final and binding if consistent with the intent expressed in the Contract Documents. The Architect's decisions regarding disputes arising between the Contractor and Owner shall be advisory.

ARTICLE 43 CASH ALLOWANCES

- **A.** All allowances stated in the Contract Documents shall be included in the Contract Sum. Items covered by allowances shall be supplied by the Contractor as directed by the Architect or Owner and the Contractor shall afford the Owner the economy of obtaining competitive pricing from responsible bidders for allowance items unless other purchasing procedures are specified in the Contract Documents.
- **B.** Unless otherwise provided in the Contract Documents:
 - (1) allowances shall cover the cost to the Contractor of materials and equipment delivered to the Project site and all applicable taxes, less applicable trade discounts;
 - (2) the Contractor's costs for unloading, storing, protecting, and handling at the site, labor, installation, overhead, profit and other expenses related to materials or equipment covered by an allowance shall be included in the Contract Sum but not in the allowances;
 - (3) if required, the Contract Sum shall be adjusted by Change Order to reflect the actual costs of an allowance.
- **C.** Any selections of materials or equipment required of the Architect or Owner under an allowance shall be made in sufficient time to avoid delay of the Work.

ARTICLE 44 PERMITS, LAWS, and REGULATIONS

A. <u>PERMITS, FEES AND NOTICES</u>

(1) Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit and other permits and governmental fees, licenses, and inspections necessary for proper execution and completion of the Work which are customarily secured after award of the Construction Contract and which are in effect on the date of receipt of bids.

(2) The Contractor shall comply with and give notices required by all laws, ordinances, rules, regulations, and lawful orders of public authorities applicable to performance of the Work.

B. <u>TAXES</u>

Unless stated otherwise in the Contract Documents, materials incorporated into the Work are exempt from sales and use tax pursuant to Section 40-9-33, <u>Code of Alabama</u>, 1975 as amended. The Owner, Contractor and its subcontractors shall be responsible for complying with rules and regulations of the Sales, Use, & Business Tax Division of the Alabama Department of Revenue regarding certificates and other qualifications necessary to claim such exemption when making qualifying purchases from vendors. The Contractor shall pay all applicable taxes that are not covered by the exemption of Section 40-9-33 and which are imposed as of the date of receipt of bids, including those imposed as of the date of receipt of bids but scheduled to go into effect after that date.

C. <u>COMPENSATION for INCREASES</u>

The Contractor shall be compensated for additional costs incurred because of increases in tax rates imposed after the date of receipt of bids.

D. ALABAMA IMMIGRATION LAW

Per ACT 2011-535 as codified in Title 31, Chapter 13 of the Code of Alabama, 1975, as amended:

The contracting parties affirm, for the duration of the agreement, that they will not violate federal immigration law or knowingly employ, hire for employment, or continue to employ an unauthorized alien within the State of Alabama. Furthermore, a contracting party found to be in violation of this provision shall be deemed in breach of the agreement and shall be responsible for all damages resulting therefrom.

E. <u>ALABAMA BOYCOT LAW</u>

Per Act 2016-312as codified in Title 41, Chapter 16, Article 1, of the Code of Alabama, 1975, as amended:

The contracting parties affirm, for the duration of the agreement, that they are not currently engaged in, and will not engage in, the boycott of a person or an entity based in or doing business with a jurisdiction with which this state can enjoy open trade.

F. ACCOUNTING OF SALES TAX EXEMPT PROJECTS

Per Act 2013-205 as codified in Title 40, Chapter 9, Article 1, of the Code of Alabama, 1975, as amended:

In bidding the work on a tax exempt project, the bid form shall provide an accounting for the tax savings.

ARTICLE 45 <u>ROYALTIES, PATENTS, and COPYRIGHTS</u>

The Contractor shall pay all royalties and license fees. The Contractor shall defend, indemnify and hold harmless the Owner, Architect, Architect's consultants, Alabama Division of Construction Management, State Department of Education (if applicable), and their agents, employees, and consultants from and against all claims, damages, losses and expenses, including but not limited to attorney's fees, arising out of, related to, or resulting from all suits or claims for infringement of any patent rights or copyrights arising out of the inclusion of any patented or copyrighted materials, methods, or systems selected by the Contractor and used during the execution of or incorporated into the Work. This indemnification does not apply to any suits or claims of infringement of any patent rights or copyrights arising out of any patenteils, methods, or systems specified in the Contract Documents. However, if the Contractor has information that a specified material, method, or system is or may constitute an infringement of a patent or copyright, the Contractor shall be responsible for any resulting loss unless such information is promptly furnished to the Architect.

ARTICLE 46 USE of the SITE

- **A.** The Contractor shall confine its operations at the Project site to areas permitted by the Owner and by law, ordinances, permits and the Contract Documents and shall not unreasonably encumber the site with materials, equipment, employees' vehicles, or debris. The Contractor's operations at the site shall be restricted to the sole purpose of constructing the Work, use of the site as a staging, assembly, or storage area for other business which the Contractor may undertake shall not be permitted.
- **B.** Unless otherwise provided in the Contract Documents, temporary facilities, such as storage sheds, shops, and offices may be erected on the Project site with the approval of the Architect and Owner. Such temporary buildings and/or utilities shall remain the property of the Contractor, and be removed at the Contractor's expense upon completion of the Work, unless the Owner authorizes their abandonment without removal.

ARTICLE 47 CUTTING and PATCHING

- **A.** The Contractor shall be responsible for all cutting, fitting, or patching that may be required to execute the Work to the results indicated in the Contract Documents or to make its parts fit together properly.
- **B.** Any cutting, patching, or excavation by the Contractor shall be supervised and performed in a manner that will not endanger persons nor damage or endanger the Work or any fully or partially completed construction of the Owner or separate contractors.

ARTICLE 48 IN-PROGRESS and FINAL CLEANUP

A. <u>IN-PROGRESS CLEAN-UP</u>

(1) The Contractor shall at all times during the progress of the Work keep the premises and surrounding area free from rubbish, scrap materials and debris resulting from the Work. Trash and combustible materials shall not be allowed to accumulate inside buildings or elsewhere on the premises. At no time shall any rubbish be thrown from window openings. Burning of trash and debris on site is not permitted.

(2) The Contractor shall make provisions to minimize and confine dust and debris resulting from construction activities.

B. FINAL CLEAN-UP

(1) Before Substantial Completion or Final Acceptance is achieved, the Contractor shall have removed from the Owner's property all construction equipment, tools, and machinery; temporary structures and/or utilities including the foundations thereof (except such as the Owner permits in

writing to remain); rubbish, debris, and waste materials; and all surplus materials, leaving the site clean and true to line and grade, and the Work in a safe and clean condition, ready for use and operation.

(2) In addition to the above, and unless otherwise provided in the Contract Documents, the Contractor shall be responsible for the following special cleaning for all trades as the Work is completed:

(a) Cleaning of all painted, enameled, stained, or baked enamel work: Removal of all marks, stains, finger prints and splatters from such surfaces.

(b) Cleaning of all glass: Cleaning and removing of all stickers, labels, stains, and paint from all glass, and the washing and polishing of same on interior and exterior.

(c) Cleaning or polishing of all hardware: Cleaning and polishing of all hardware.

(d) Cleaning all tile, floor finish of all kinds: Removal of all splatters, stains, paint, dirt, and dust, the washing and polishing of all floors as recommended by the manufacturer or required by the Architect.

(e) Cleaning of all manufactured articles, materials, fixtures, appliances, and equipment: Removal of all stickers, rust stains, labels, and temporary covers, and cleaning and conditioning of all manufactured articles, material, fixtures, appliances, and electrical, heating, and air conditioning equipment as recommended or directed by the manufacturers, unless otherwise required by the Architect; blowing out or flushing out of all foreign matter from all equipment, piping, tanks, pumps, fans, motors, devices, switches, panels, fixtures, boilers, sanitizing potable water systems; and freeing identification plates on all equipment of excess paint and the polishing thereof.

C. <u>OWNER'S RIGHT to CLEAN-UP</u>

If the Contractor fails to comply with these clean-up requirements and then fails to comply with a written directive by the Architect to clean-up the premises within a specified time, the Architect or Owner may implement appropriate clean-up measures and the cost thereof shall be deducted from any amounts due or to become due the Contractor.

ARTICLE 49 LIQUIDATED DAMAGES

- **A.** Time is the essence of the Contract. Any delay in the completion of the Work required by the Contract Documents may cause inconvenience to the public and loss and damage to the Owner including but not limited to interest and additional administrative, architectural, inspection and supervision charges. By executing the Construction Contract, the Contractor agrees that the Contract Time is sufficient for the achievement of Substantial Completion.
- **B.** The Contract Documents may provide in the Construction Contract or elsewhere for a certain dollar amount for which the Contractor and its Surety (if any) will be liable to the Owner as liquidated damages for each calendar day after expiration of the Contract Time that the Contractor fails to achieve Substantial Completion of the Work. If such daily liquidated damages are provided for, Owner and Contractor, and its Surety, agree that such amount is reasonable and agree to be bound thereby.
- C. If a daily liquidated damage amount is not otherwise provided for in the Contract Documents, a

time charge equal to six percent interest per annum on the total Contract Sum may be made against the Contractor for the entire period after expiration of the Contract Time that the Contractor fails to achieve Substantial Completion of the Work.

D. The amount of liquidated damages due under either paragraph B or C, above, may be deducted by the Owner from the moneys otherwise due the Contractor in the Final Payment, not as a penalty, but as liquidated damages sustained, or the amount may be recovered from Contractor or its Surety. If part of the Work is substantially completed within the Contract Time and part is not, the stated charge for liquidated damages shall be equitably prorated to that portion of the Work that the Contractor fails to substantially complete within the Contract Time. It is mutually understood and agreed between the parties hereto that such amount is reasonable as liquidated damages.

ARTICLE 50 USE of FOREIGN MATERIALS

- **A.** In the performance of the Work the Contractor agrees to use materials, supplies, and products manufactured, mined, processed or otherwise produced in the United States or its territories, if same are available at reasonable and competitive prices and are not contrary to any sole source specification implemented under the Public Works Law.
- **B.** In the performance of the Work the Contractor agrees to use steel produced in the United States if the Contract Documents require the use of steel and do not limit its supply to a sole source pursuant to the Public Works Law. If the Owner decides that the procurement of domestic steel products becomes impractical as a result of national emergency, national strike, or other cause, the Owner shall waive this restriction.
- **C.** If domestic steel or other domestic materials, supplies, and products are not used in accordance with preceding Paragraphs A and B, the Contract Sum shall be reduced by an amount equal to any savings or benefits realized by the Contractor.
- **D.** This Article applies only to Public Works projects financed entirely by the State of Alabama or any political subdivision of the state.

ARTICLE 51 <u>PROJECT SIGN</u>

(Not required for locally-funded SDE projects.)

If the Contract Sum (as awarded) is \$100,000.00 or more, the Contractor shall furnish and erect a project sign as shown in "Detail of Project Sign" (DCM Form C-15) bound in the Project Manual. The project sign shall be erected in a prominent location selected by the Architect and Owner and shall be maintained in good condition until completion of Work. If the Contract involves Work on multiple sites, only one sign is required, which shall be erected on one of the sites in a location selected by the Architect and Owner.

ARTICLE 37 CONTRACTOR'S and SUBCONTRACTORS' INSURANCE

(Provide entire Article 37 to Contractor's insurance representative.)

A. <u>GENERAL</u>

(1) **RESPONSIBILITY.** The Contractor shall be responsible to the Owner from the time of the signing of the Construction Contract or from the beginning of the first work, whichever shall be earlier, for all injury or damage of any kind resulting from any negligent act or omission or breach, failure or other default regarding the work by the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of who may be the owner of the property.

(2) **INSURANCE PROVIDERS.** Each of the insurance coverages required below shall be issued by an insurer licensed by the Insurance Commissioner to transact the business of insurance in the State of Alabama for the applicable line of insurance, and such insurer (or, for qualified self-insureds or group self-insureds, a specific excess insurer providing statutory limits) must have a Best Policyholders Rating of "A-" or better and a financial size rating of Class V or larger.

(3) NOTIFICATION ENDORSEMENT. Each policy shall be endorsed to provide that the insurance company agrees that the policy shall not be canceled, changed, allowed to lapse or allowed to expire for any reason until thirty days after the Owner has received written notice by certified mail as evidenced by return receipt or until such time as other insurance coverage providing protection equal to protection called for in the Contract Documents shall have been received, accepted and acknowledged by the Owner. Such notice shall be valid only as to the Project as shall have been designated by Project Name and Number in said notice.

(4) **INSURANCE CERTIFICATES.** The Contractor shall procure the insurance coverages identified below, or as otherwise required in the Contract Documents, at the Contractor's own expense, and to evidence that such insurance coverages are in effect, the Contractor shall furnish the Owner an insurance certificate(s) acceptable to the Owner and listing the Owner as the certificate holder. The insurance certificate(s) must be delivered to the Owner with the Construction Contract and Bonds for final approval and execution of the Construction Contract. The insurance certificate must provide the following:

- (a) Name and address of authorized agent of the insurance company
- (b) Name and address of insured
- (c) Name of insurance company or companies
- (d) Description of policies
- (e) Policy Number(s)
- (**f**) Policy Period(s)
- (g) Limits of liability
- (h) Name and address of Owner as certificate holder
- (i) Project Name and Number, if any
- (j) Signature of authorized agent of the insurance company
- (k) Telephone number of authorized agent of the insurance company
- (I) Mandatory thirty day notice of cancellation / non-renewal / change

(5) MAXIMUM DEDUCTIBLE. Self-insured retention, except for qualified self-insurers or group self-insurers, in any policy shall not exceed \$25,000.00.

B. <u>INSURANCE COVERAGES</u>

Unless otherwise provided in the Contract Documents, the Contractor shall purchase the types of insurance coverages with liability limits not less than as follows:

(1) WORKERS' COMPENSATION and EMPLOYER'S LIABILITY INSURANCE

(a) Workers' Compensation coverage shall be provided in accordance with the statutory coverage required in Alabama. A group insurer must submit a certificate of authority from the Alabama Department of Industrial Relations approving the group insurance plan. A self-insurer must submit a certificate from the Alabama Department of Industrial Relations stating the Contractor qualifies to pay its own workers' compensation claims.

- (b) Employer's Liability Insurance limits shall be at least:
 - .1 Bodily Injury by Accident \$1,000,000 each accident
 - .2 Bodily Injury by Disease \$1,000,000 each employee

(2) COMMERCIAL GENERAL LIABILITY INSURANCE

(a) Commercial General Liability Insurance, written on an ISO Occurrence Form (current edition as of the date of Advertisement for Bids) or equivalent, shall include, but need not be limited to, coverage for bodily injury and property damage arising from premises and operations liability, products and completed operations liability, blasting and explosion, collapse of structures, underground damage, personal injury liability and contractual liability. The Commercial General Liability Insurance shall provide at minimum the following limits:

Coverage

- .1 General Aggregate
- .2 Products, Completed Operations Aggregate
- .3 Personal and Advertising Injury
- .4 Each Occurrence

Limit \$ 2,000,000.00 per Project \$ 2,000,000.00 per Project \$ 1,000,000.00 per Occurrence \$ 1,000,000.00

(b) Additional Requirements for Commercial General Liability Insurance:

.1 The policy shall name the Owner, Architect, Alabama Division of Construction Management, State Department of Education (if applicable), and their agents, consultants and employees as additional insureds, state that this coverage shall be primary insurance for the additional insureds; and contain no exclusions of the additional insureds relative to job accidents.

.2 The policy must include separate per project aggregate limits.

(3) COMMERCIAL BUSINESS AUTOMOBILE LIABILITY INSURANCE

(a) Commercial Business Automobile Liability Insurance which shall include coverage for bodily injury and property damage arising from the operation of any owned, non-owned or hired automobile. The Commercial Business Automobile Liability Insurance Policy shall provide not less than \$1,000,000 Combined Single Limits for each occurrence.

(b) The policy shall name the Owner, Architect, Alabama Division of Construction Management, State Department of Education (if applicable), and their agents, consultants, and employees as additional insureds.

(4) COMMERCIAL UMBRELLA LIABILITY INSURANCE

(a) Commercial Umbrella Liability Insurance to provide excess coverage above the Commercial General Liability, Commercial Business Automobile Liability and the Workers' Compensation and Employer's Liability to satisfy the minimum limits set forth herein.

(b) Minimum <u>Combined</u> Primary Commercial General Liability and Commercial/Excess Umbrella Limits of:

- **.1** \$ 5,000,000 per Occurrence
- **.2** \$ 5,000,000 Aggregate
- (c) Additional Requirements for Commercial Umbrella Liability Insurance:

.1 The policy shall name the Owner, Architect, Alabama Division of Construction Management, State Department of Education (if applicable), and their agents, consultants, and employees as additional insureds.

.2 The policy must be on an "occurrence" basis.

(5) **BUILDER'S RISK INSURANCE**

(a) The Builder's Risk Policy shall be made payable to the Owner and Contractor, as their interests may appear. The policy amount shall be equal to 100% of the Contract Sum, written on a Causes of Loss - Special Form (current edition as of the date of Advertisement for Bids), or its equivalent. All deductibles shall be the sole responsibility of the Contractor.

(b) The policy shall be endorsed as follows:

"The following may occur without diminishing, changing, altering or otherwise affecting the coverage and protection afforded the insured under this policy:

(i) Furniture and equipment may be delivered to the insured premises and installed in place ready for use; or

(ii) Partial or complete occupancy by Owner; or

(iii) Performance of work in connection with construction operations insured by the Owner, by agents or lessees or other contractors of the Owner, or by contractors of the lessee of the Owner."

C. <u>SUBCONTRACTORS' INSURANCE</u>

(1) WORKERS' COMPENSATION and EMPLOYER'S LIABILITY INSURANCE. The Contractor shall require each Subcontractor to obtain and maintain Workers' Compensation and Employer's Liability Insurance coverages as described in preceding Paragraph B, or to be covered by the Contractor's Workers' Compensation and Employer's Liability Insurance while performing Work under the Contract.

(2) **LIABILITY INSURANCE.** The Contractor shall require each Subcontractor to obtain and maintain adequate General Liability, Automobile Liability, and Umbrella Liability Insurance coverages similar to those described in preceding Paragraph B. Such coverage shall be in effect at all times that a Subcontractor is performing Work under the Contract.

(3) **ENFORCEMENT RESPONSIBILITY.** The Contractor shall have responsibility to enforce its Subcontractors' compliance with these or similar insurance requirements; however, the Contractor shall, upon request, provide the Architect or Owner acceptable evidence of insurance for any Subcontractor.

D. <u>TERMINATION of OBLIGATION to INSURE</u>

Unless otherwise expressly provided in the Contract Documents, the obligation to insure as provided herein shall continue as follows:

(1) **BUILDER'S RISK INSURANCE.** The obligation to insure under Subparagraph B(5) shall remain in effect until the Date of Substantial Completion as shall be established in the Certificate of Substantial Completion. In the event that multiple Certificates of Substantial Completion covering designated portions of the Work are issued, Builder's Risk coverage shall remain in effect until the Date of Substantial Completion as shall be established in the last issued Certificate of Substantial Completion. However, in the case that the Work involves separate buildings, Builder's Risk coverage of each separate building may terminate on the Date of Substantial Completion as established in the Certificate of Substantial Completion as

(2) **PRODUCTS and COMPLETED OPERATIONS.** The obligation to carry Products and Completed Operations coverage specified under Subparagraph B(2) shall remain in effect for two years after the Date(s) of Substantial Completion.

(3) ALL OTHER INSURANCE. The obligation to carry other insurance coverages specified under Subparagraphs B(1) through B(4) and Paragraph C shall remain in effect after the Date(s) of Substantial Completion until such time as all Work required by the Contract Documents is completed. Equal or similar insurance coverages shall remain in effect if, after completion of the Work, the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, returns to the Project to perform warranty or maintenance work pursuant to the terms of the Contract Documents.

E. WAIVERS of SUBROGATION

The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors performing construction or operations related to the Project, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss. But said waiver shall apply only to the extent the loss or damage is covered by builder's risk insurance applicable to the Work or to other property located within or adjacent to the Project, except such rights as they may have to proceeds of such insurance held by the Owner or Contractor as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors, if any, and the subcontractor, subsubcontractors, suppliers, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The Policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to the person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged. The waivers provided for in this paragraph shall not be applicable to loss or damage that occurs after final acceptance of the Work.

APPLICATION and CERTIFICATE for PAYMENT

DCM (BC) No	
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Application No. _____

Data

Attach DCM Form C-10SOV: Schedule of Values	Date:
TO OWNER: Entity Name: Address:	PROJECT:
FROM CONTRACTOR: Company Name: Address:	ARCHITECT/ENGINEER: Firm Name: Address:
Total Original Contract Fully Executed Change Order(s) Numbers Total Contract To Date	s through \$ \$
 Work Completed to Date per attached Schedule of Stored Materials (<i>Attach list or Form DCM C10-SM, Invent</i> Total Completed Work and Stored Materials (of Values \$ story of Stored Materials) \$ % of Contract To Date) \$ s[TCWSM] is retained when \$ ate [TCTD]. 2.5% of TCTD is \$. 0 is retained on final pay. app.) \$ \$ \$. 0 is retained on final pay. app.) \$ \$ \$. 0 is retained on final pay. app.) \$ \$ \$. 0 is retained on final pay. app.) \$ \$ \$. 0 is retained on final pay. app.) \$ \$ \$. 0 is retained on final pay. app.) \$ \$ \$. 0 is retained on final pay. app.) \$ \$ \$. 0 is retained on final pay. app.) \$ \$ \$. 0 is retained on final pay. app.) \$ \$ \$. 0 is retained on final pay. app.) \$. 1 accordance with the Contract Documents, the Architect's Engineer's Knowledge and belief, the Work has progressed to the point indicated herein, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the amount approved.
Notary Public's Signature	Date
INSTRUCTIONS • Four copies of pay. app., each with original signatures and all attachments re • Date of first payment application cannot precede the Notice to Proceed's Begi • Pay. app. must exactly match an attached DCM Form C-10SOV: Schedule of V • A change order must be fully executed before inclusion on a payment applicatio • On a final payment application, all change orders must be fully executed and in • Contractor's signature date cannot precede the payment application date. • Progress schedules must be included with non-final payment applications. • One payment application per month may be submitted.	APPROVAL equired. n Date. /alues. on. cluded. BySignature
 Retainage is released when the Certificate of Substantial Completion is fully ex all other close-out requirements per General Conditions Article 34 are complete the final payment application is reviewed, approved and processed. DCM processes pay. apps. of state agencies, PSCA and other bond-funded proj 	ecuted, Name & Title bd and Date

DCM Form C-10SOV January 2020

Project:

Contractor Company:

DCM (BC) #:

Application #: Application Date:

Period From:

Period To:

Retainage: 5% of Completed Work and Stored Materials to Date (G) is retained when G Total is less than 50% of Scheduled Value (C) Total. 2 5% of C is retained when G Total is 50% or more of C Total. 0 is retained on final payment application

А	В	С	D	E	F	G	G		Ι
Item No.	Description of Work	Scheduled Value (including fully executed change orders)	Work Co From Previous Application (D + E)	ompleted This Period	Materials Presently Stored (Not in D or E)	$\begin{array}{c} \text{Completed Work} \\ \text{and Stored} \\ \text{Materials to Date} \\ (D+E+F) \end{array}$	% of Contract to Date (G/C)	Balance to Finish (C - G)	Retainage (Variable Rate)
1.						-			\$0.00
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7.						-			\$0.00
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INVENTORY OF STORED MATERIALS

Project:

Contractor:

DCM (BC) No._____

For Estimate No._____

For Period Ending_____

А	В	С	D	E	F	
DESCRIPTION	MATERIALS STORED LAST PERIOD	PURCHASED THIS PERIOD	TOTAL COLUMNS B + C	MATERIALS USED THIS PERIOD	MATERIALS PRESENTLY STORED	
					1	DCM Form
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PR	OGRESS SCHEDULE & F	REPORT			CONTRACTOR: (Cont			ontractor may use own form in lieu of		DATE OF REPORT:				
PRC	JECT:				Form C-1	L1)								
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										PROJECTED COMPLETION DATE:				
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	PROTECTION											<u> </u>		90%
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9.	FINISHES									_	_	$ \rightarrow $	J	70%
10.	SPECIALTIES										<u> </u>	<u> </u>	J	60%
11.	EQUIPMENT												ļ	50%
12.	FURNISHINGS												<u> </u>	40%
13.	SPECIAL CONSTRUCTION												<u> </u>	30%
14.	CONVEYING SYSTEMS												<u> </u>	20%
15.	MECHANICAL												<u> </u>	10%
16.	ELECTRICAL												<u> </u>	0%
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LEGEND: ANTICIPATED ACTIVITY ACTUAL ACTIVITY ANTICIPATED CASH FLOW ACTUAL CASH FLOW					SCHEDULED OVER 12 MONTHS.			-11)20						

CONTRACT CHANGE ORDER

Change Order No	Date	DCM (BC) No
TO (Contractor):		PROJECT:
Co. Name:		
Address:		

TERMS: You are hereby authorized, subject to the provisions of your Contract for this project, to make the following changes thereto in accordance with your proposal(s) dated ______

FURNISH the necessary labor, materials, and equipment to (Description of work to be done or changes to be made):

ORIGINAL CONTRACT SUM	\$
NET TOTAL OF PREVIOUS CHANGE ORDERS	\$
PREVIOUS REVISED CONTRACT SUM	\$
This change order will increase decrease the c	contract sum by \$
REVISED CONTRACT SUM, INCLUDING THIS CH	HANGE ORDER \$
EXTENSION OF TIME resulting from this Change Order	None or Calendar days.
The Owner certifies this Change Order was executed in accordance APPROVALS	with the provisions of Title 39, Code of Alabama, 1975, as amended. CONTRACTING PARTIES
By Governor (all State Agencies projects)	Contractor Company
By Secretary of State (Conservation projects only)	BySignature
ByAgency, Title:	
	Owner Entity
Architectural Firm:	Bv
ALABAMA DEPARTMENT OF FINANCE, REAL PROPERTY MANAGEMENT (RPM), DIVISION OF CONSTRUCTION MANAGEMENT (DCM)	Signature Name & Title
By	Owner Entity
By	By Signature
By DCM Director (all State Agencies projects)	Name & Title CONSENT OF SURETY (for additive \$ change orders only)
Decommonded Dr.	Surety Company
DCM Contract Administrator (all State Agencies projects)	By
Signature/review flow: Contractor (> Surety for additiv RPM/DCM > Finance-Legal (review and stamp only) Renovation Finance Authority [ABRFA] projects then go to Fin Secretary of State). Following the Governor's signature or for document returns to DCM which distributes the fully execut	re \$ changes only) > Architect/Engineer > Owner > (> Finance, Finance sub-Agencies & Alabama Building nance Director) > Governor (> Conservation projects then go to Conservation projects the Secretary of State's signature, the ed Change Order to all parties. Note: Transportation inserts an

Page 1 of 1

additional signature sheet.

CERTIFICATE OF

ROUTING PROCEDURES ON NEXT PAGE

SUBSTANTIAL COMPLETION

Do not staple this form and/or attachments; use clips. Print single-sided; do not submit double-side printed documents.

DCM (BC) No.

OWNER(S):	ARCHITECT:
CONTRACTOR:	BONDING COMPANY:
PROJECT:	
Substantial Completion has been achieved for the	entire Work the following portion of the Work:

The Date of Substantial Completion of the Work covered by this certificate is established to be _____

"Substantial Completion" means the designated Work is sufficiently complete, in accordance with the Contract Documents, such that the Owner may occupy or utilize the Work for its intended use without disruption or interference by the Contractor in completing or correcting any remaining unfinished Work. The Date of Substantial Completion is the date upon which all warranties for the designated Work commence, unless otherwise agreed and recorded herein.

Punch List: A _____ page list of items to be completed or corrected prior to the Owner's approval of Final Payment is attached hereto, but does not alter the Contractor's responsibility to complete or correct all Work in full compliance with the Contract Documents. The Contractor shall complete or correct all items on the attached list, ready for re-inspection for Final Acceptance, within 30 days after the above Date of Substantial Completion, unless another date is stated here: ______.

If completed or corrected within this period, warranties of these items commence on the Date of Substantial Completion, otherwise such warranties commence on the date of Final Acceptance of each item.

Only <u>one</u> (1) originally executed substantial completion form shall be routed for signature. DCM office will forward the original to the Owner and provide copies to all other parties.

RECOMMENDED BY:	
ARCHITECT/ENGINEER:	DATE:
CONTRACTING PARTIES:	
CONTRACTOR:	DATE:
OWNER:	DATE:
	DATE:
APPROVALS:	
DCM INSPECTOR:	DATE:
DCM CHIEF INSPECTOR:	DATE:
DCM DIRECTOR:	DATE:

CERTIFICATE OF SUBSTANTIAL COMPLETION ROUTING PROCEDURE

Only <u>one</u> (1) originally executed substantial completion form shall be routed for signature. DCM office will forward the original to the owner and provide copies to all other parties.

ARCHITECT/ENGINEER: Please forward to Contractor after signature and date. <u>Provide Owner</u> with DCM Inspector's name & field office address; territories and addresses are available at www.dcm.alabama.gov/staff.aspx.

CONTRACTOR: Please forward to Owner after signature and date.

OWNER: Please forward to DCM Inspector's <u>field office address</u> after signature and date; DCM Inspector territories and addresses are available at www.dcm.alabama.gov/staff.aspx.

DCM INSPECTOR: After signature and date, will forward document to DCM office.

DCM OFFICE: After review and signature/date by DCM Chief Inspector and DCM Director, DCM Office will forward original document to Owner and will distribute copies to all other parties.

NOTICE

THEEXECUTED"GENERALCONTRACTOR'SROOFING GUARANTEE"(DCM Form C-9)AND ANYOTHERROOFING WARRANTYREQUIREDBY THECONTRACT MUSTACCOMPANYTHISCERTIFICATETO OBTAIN DCM APPROVAL.

SAMPLE FORM OF ADVERTISEMENT FOR COMPLETION

LEGAL NOTICE

In accordance with Chapter 1, Title 39, Code of Alabama, 1975, as amended, notice is hereby given

that				,
	(Contract	or Company Name)		
Contractor, has comp	pleted the Contract for	(Construction)	(Renovation)	(Alteration)
(Equipment)	(Improvement) of	(Nan	<i>ne of Project</i>):	

at _

(Insert location data in County or City)

for the State of Alabama and the (County) (City) of ______ Owner(s), and have made request for final settlement of said Contract. All persons having any claim for labor, materials, or otherwise in connection with this project should immediately notify

(Architect)

(Contractor)

(Business Address)

NOTE: This notice must be run once a week for four successive weeks for projects exceeding \$50,000.00. For projects of \$50,000.00 or less, run one time only. A copy of the publisher's affidavit of publication (including a copy of the advertisement) and shall be submitted by the Contractor to the Design Professional for inclusion with DCM Form B-13: Final Payment Checklist for state agencies, PSCA-funded and other bond-funded projects.



Revised August 2019

ALABAMA DEPARTMENT OF FINANCE REAL PROPERTY MANAGEMENT Division of Construction Management

Department Use Only
Invoice # _____
Date Paid _____
Confirmation #

PERMIT FEE & PERMIT RE-INSPECTION FEE CALCULATON WORKSHEET

DCM (BC) # Date							
Project Name; Owner/Architect/Engine	Project Name; Owner/Architect/Engineer Project # & Phase/Package #						
Owner Entity Name							
Architect/Engineer Firm Name							
Contractor Company Name							
Awarded Contract Sum	·····						
Select ONE of the following:	Permit Fee	Permit Re-Inspection Fee					
Email address(es) for Payment Recei	pt:						
PERMIT FEE CALCULATION:							
Awarded Contract Sum is less t	han \$1,000 N/A						
Awarded Contract Sum is \$1,00	<u>1 - \$50,000</u>						
Contract Sum less \$1,000=	/1,000 x \$5.00=	+\$15.00=					
Awarded Contract Sum is \$50,001	- \$100,000						
Contract Sum less \$50,000=	/1,000 x \$4.00=	+\$260.00=					
Awarded Contract Sum is \$100,00	<u>1 - \$500,000</u>						
Contract Sum less \$100,000=	/1,000 x \$3.00=	+\$460.00=					
Awarded Contract Sum is \$500,00	1 and up						
Contract Sum less \$500,000=	/1,000 x \$2.00=	+\$1,660.00=					
PERMIT RE-INSPECTION FEE:							
Flat fee of \$1,500.00 per occurrence		TOTAL DUE:					

All state agency, community college, public K-12 school and requested university projects must have a Pre-Construction Conference facilitated by a DCM Inspector as well as have periodic inspections. The Permit Fee covers project inspections and must be paid before a Pre-Construction Conference is scheduled with DCM Inspectors; see Pre-Construction Conference Checklist (DCM Form B-8) at www.dcm.alabama.gov/forms. The Permit Fee is due when a construction contract or self-performance letter is received by DCM, whether the contract is sent by the Architect/Engineer or State Department of Education.

Make check payable to: "Finance - Construction Management," include the DCM (BC) Project # on the check and attach the fee worksheet. Mail payment to: Finance - Construction Management, P.O. Box 301150, Montgomery, AL 36130-1150.

State agency inter-fund transfer: contact Jennie Jones at 334-242-4808 or jennie.jones@realproperty.alabama.gov.

Inspections must be requested by the Contractor in writing/email to the design professional who will then consult the DCM Inspector for an available date. The design professional should then send a confirmation email, copying the Contractor, the Owner, the Inspector and the DCM main office (inspections@realproperty.alabama.gov). Inspections may be canceled or rescheduled at the Inspector's availability with a minimum of 48 hours notice by email given to all parties. If appropriate notice is not given, a Re-Inspection Fee of \$1,500.00 may be charged. Certain benchmarks are required for inspections as listed in the Pre-Construction Conference Checklist (DCM Form B-8). If the minimum requirements are not met and the Inspector is obliged to return to complete the inspection, a Re-Inspection Fee of \$1,500.00 per occurrence will be charged. Re-Inspection fees are excluded from Final Reconciliation of Fees.

After substantial completion the Architect/Engineer or Owner must report to jennie.jones@realproperty.alabama.gov the final project cost including all change orders and sales tax credits received by the Owner. A Final Reconciliation of Fees Statement will be emailed to the Owner. Any amount due to DCM must be paid prior to the Year-End Inspection. Any credit will be refunded to the Owner.

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Project information.
 - 2. Work covered by Contract Documents.
 - 3. Access to site.
 - 4. Coordination with occupants.
 - 5. Work restrictions.
 - 6. Specification and drawing conventions.

1.2 PROJECT INFORMATION

- A. Project Identification: Alabama A&M University Knight Complex Cafeteria Renovation
 - 1. Project Location: Normal, Alabama
- B. Owner: Alabama A&M University
- C. Architect: Fuqua & Partners Architects.
- D. Fuqua & Partners Architects Project Number: 02419

1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and consists of the following:
 - 1. The Knight Complex cafeteria renovations includes interior renovation of the existing cafeteria and lobby, and two additional dining rooms connected to the existing cafeteria. The renovations include replacement and reconfiguring of serving equipment, new openings and interior windows, and new finishes throughout. The area of work is approximately 4,000 square feet.
- B. Type of Contract.
 - 1. Project will be constructed under a single prime contract.

1.4 ACCESS TO SITE

- A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- B. Use of Site: Limit use of Project site to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
 - 1. Limits: Confine construction operations to area of work.
 - 2. Driveways, Walkways and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - **a.** Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

1.5 COORDINATION WITH OCCUPANTS

- A. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.
 - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
 - 2. Provide not less than **72** hours' notice to Owner of activities that will affect Owner's operations.
- B. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.
 - 1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
 - 2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.

- 3. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
- 4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.6 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets, sidewalks and with other requirements of authorities having jurisdiction.
- B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 - 1. Notify Architect and Alabama A&M University not less than two days in advance of proposed utility interruptions.
 - 2. Obtain Architect and Alabama A&M University's written permission before proceeding with utility interruptions.
- C. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
 - 1. Notify Architect and Owner not less than two days in advance of proposed disruptive operations.
 - 2. Obtain Architect and Owner's written permission before proceeding with disruptive operations.
- D. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.
- E. Drug Testing: If the Owner (Alabama A&M University) at any time deems drug testing is appropriate, all workers both General and Sub-contractor by their presence on site shall be subject to and consent to testing. Both General and subcontractors are responsible for notifying their workers of this condition of consent.

1.7 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

- 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
 - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 - 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
 - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
- B. Types of allowances include the following:
 - 1. Lump-sum allowances.
 - 2. Unit-cost allowances.
 - 3. Contingency allowances.
- C. Related Requirements:
 - 1. Section 014000 "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.

1.2 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Architect from the designated supplier.

1.3 ACTION SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

1.4 INFORMATIONAL SUBMITTALS

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

ALLOWANCES

1.5 COORDINATION

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

1.6 LUMP-SUM ALLOWANCE

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

1.7 CONTINGENCY ALLOWANCES

- A. Use the contingency allowance only as directed for the Owner's purposes, to cover such things as unforseen work or additional work requested by Owner and only by Change Orders which designate amounts to be charged to the allowance.
 - 1. Change Orders authorizing use of funds from the contingency allowance will include all the Contractor's related costs and reasonable overhead and profit margins.
 - 2. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

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

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

3.3 SCHEDULE OF ALLOWANCES

- 1. Allowance No. 1: Contingency Allowance: Include the lump sum of \$35,000.00 for use according to Owner's written instructions.
 - a. This allowance includes material cost, receiving, handling and installation and Contractor overhead and profit.
 - 2. Allowance No. 2: Quantity Allowance: Include 100 Linear Feet by 12-inches wide by 4-inches deep for cutting and removal of existing concrete slabs on grade.
 - a. Coordinate quantity allowance adjustment with unit-price requirements in Section 012200 UNIT PRICES.
 - 3. Allowance No. 3: Quantity Allowance: Include 100 Linear Feet by 12-inches wide by 4inches deep for the installation of concrete slab on grades for existing construction removed in accordance with Allowance No.2.
 - a. Coordinate quantity allowance adjustment with unit-price requirements in Section 012200 UNIT PRICE.
 - b. Provide materials for Allowance No. 3 in accordance with section 033000 CAST-IN-PLACE CONCRETE.
 - 4. Allowance No. 4: Lump Sum Allowance: Include the lump sum of \$12,000.00 for the construction and installation of NEW CASHIER DESK as noted on sheet A1.2 of Construction Documents.
 - a. This allowance includes material cost, receiving, handling and installation and Contractor overhead and profit.
 - 5. Allowance No. 5: Quantity Allowance: Include 200 Square Feet (SF) for polymermodified, self-leveling, hydraulic cement underlayment for application below interior floor coverings.
 - a. Coordinate quantity allowance adjustments with unit-price requirements in Section 102200 UNIT PRICES.
 - b. Provide materials for Allowance No. 5 in accordance with Section 035416 HYDRAULIC CEMENT UNDERLAYMENT.

END OF SECTION 012100

ALLOWANCES

SECTION 012200 - UNIT PRICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.
- B. Related Requirements:
 - 1. Division 01 "Contract Modification Procedures" procedures related to Change Orders.

1.2 DEFINITIONS

A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.3 PROCEDURES

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

- 3.1 SCHEDULE OF UNIT PRICES
 - A. Unit Price No. 1: Cutting, removal and disposal of existing concrete slab on grade material.

1. Description: Removal and disposal of existing concrete slab on grade construction in accordance with section 017300-EXECUTION, 3.6 CUTTING AND PATCHING and Section 024119-SELECTIVE DEMOLITION.

- 2. Unit of Measure: Linear Feet (LF) for a 12-inch by 4-inch section.
- 3. Quantity Allowance: Refer to Section 012100-ALLOWANCES for quantity.
- B. Unit Price No. 2: Cast-In-Place Concrete.
 - 1. Description: Placement of cast-in-place concrete slab on grade construction in accordance with Section 033000-CAST-IN-PLACE CONCRETE for areas affected by Unit Price No. 1.
 - 2. Unit of Measure: Linear Feet (LF) for a 12-inch wide by 4-inch deep section.
 - 3. Quantity Allowance: Refer to Section 012100-ALLOWANCES for quantity.
- C. Unit Price No. 3: Hydraulic Cement Underlayment.
 - 1. Description: Placement of hydraulic cement underlayment in accordance with Section 035416-HYDRAULIC CEMENT UNDERLAYMENT for areas affected by Unit Price No. 3.
 - 2. Unit of Measure: Square Feet (SF) of floor surface.
 - 3. Quantity Allowance: Refer to Section 012100-ALLOWANCES for quantity.

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use facsimile of form provided in Project Manual.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
 - b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.

- c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
- d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
- e. Samples, where applicable or requested.
- f. Certificates and qualification data, where applicable or requested.
- g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
- h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
- i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
- j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
- k. Cost information, including a proposal of change, if any, in the Contract Sum.
- I. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
- m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
- 3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
 - a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.7 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
 - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Substitution request is fully documented and properly submitted.
 - c. Requested substitution will not adversely affect Contractor's construction schedule.
 - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - e. Requested substitution is compatible with other portions of the Work.
 - f. Requested substitution has been coordinated with other portions of the Work.
 - g. Requested substitution provides specified warranty.
 - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Not allowed unless otherwise indicated.
- C. Substitutions for Convenience: Architect will consider requests for substitution if received within 60 days after the Notice of Award. Requests received after that time may be considered or rejected at discretion of Architect.
 - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.

- b. Requested substitution does not require extensive revisions to the Contract Documents.
- c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
- d. Substitution request is fully documented and properly submitted.
- e. Requested substitution will not adversely affect Contractor's construction schedule.
- f. Requested substitution has received necessary approvals of authorities having jurisdiction.
- g. Requested substitution is compatible with other portions of the Work.
- h. Requested substitution has been coordinated with other portions of the Work.
- i. Requested substitution provides specified warranty.
- j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule. Cost-loaded Critical Path Method Schedule may serve to satisfy requirements for the schedule of values.
 - 1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
 - a. Schedule of Values to be provided on forms acceptable to the Alabama Department of Finance, Real Property Management, and Division of Construction Management.
 - b. Submittal schedule.
 - c. Items required to be indicated as separate activities in Contractor's construction schedule.
 - 2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.

- 1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Architect's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
- 2. Arrange schedule of values consistent with format of Division of Construction Management Form C-10SOV.
- 3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of **five** percent of the Contract Sum.
 - a. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.
- 4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
- 5. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.
- 6. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
- 7. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
- 8. Purchase Contracts: Provide a separate line item in the schedule of values for each purchase contract. Show line-item value of purchase contract. Indicate owner payments or deposits, if any, and balance to be paid by Contractor.

Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule. Cost-loaded Critical Path Method Schedule may serve to satisfy requirements for the schedule of values.

- 1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with continuation sheets.

- b. Submittal schedule.
- c. Items required to be indicated as separate activities in Contractor's construction schedule.
- 2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
- 3.
- a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
- 4. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
 - 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
 - 1. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.
- C. Application for Payment Forms: Use for Division of Construction Management Form C-10 Application and Certification for Payment.
- D. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
 - 1. Submit on Division of Construction Management form C-10SM Inventory of Stored Materials.
 - 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 - 3. Provide summary documentation for stored materials indicating the following:

- a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
- b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
- c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- E. Transmittal: Submit four signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
 - 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application. Insert instructions for preparation and submittal of waivers or releases here if not stated in the Supplementary Conditions.
 - 2. Lien laws vary widely in the U.S. Owner's legal counsel and financial advisors, not Architect, should establish requirements for waivers of mechanic's lien. Both "Waivers of Mechanic's Lien" paragraphs below are examples of ways to handle waivers of lien. Retain one or replace both with another effective method.
- J. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
 - 1. List of subcontractors.
 - 2. Schedule of values.
 - 3. Sustainable design submittal for project materials cost data.
 - 4. Contractor's construction schedule (preliminary if not final).
 - 5. Schedule of unit prices.
 - 6. Submittal schedule (preliminary if not final).
 - 7. List of Contractor's staff assignments.
 - 8. List of Contractor's principal consultants.
 - 9. Copies of building permits.
 - 10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 - 11. Initial progress report.
 - 12. Report of preconstruction conference.
 - 13. Certificates of insurance and insurance policies.
 - 14. Performance and payment bonds.
 - 15. Data needed to acquire Owner's insurance.
- F. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
 - 1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.

- 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- G. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
 - 1. Evidence of completion of Project closeout requirements.
 - 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 - 3. Updated final statement, accounting for final changes to the Contract Sum.
 - 4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
 - 5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
 - 6. AIA Document G707, "Consent of Surety to Final Payment."
 - 7. Evidence that claims have been settled.
 - 8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
 - 9. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for project meetings, including, but not limited to, the following:
 - 1. Pre-construction conferences.
 - 2. Pre-installation conferences.
 - 3. Progress meetings.
 - 4. Coordination meetings.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 1 Section "Submittals" for submitting the Contractor's Construction Schedule.
 - 2. All Divisions and Sections requiring pre-installation conferences.

1.3 PRE-CONSTRUCTION CONFERENCE

A. Schedule a preconstruction conference before starting construction, at a time convenient to the Owner's Representative and the Architect, but no later than 15 days after execution of the Agreement. Hold the conference at the Project Site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.

1. Schedule and Conduct Pre-Construction Meeting in accordance with the requirements of Division of Construction Management.

- B. Attendees: Authorized representatives of the Owner, Architect, and their consultants; the Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.
- C. Agenda: Discuss items of significance that could affect progress, including the following:
 - 1. Tentative construction schedule.
 - 2. Critical work sequencing.
 - 3. Designation of responsible personnel.
 - 4. Procedures for processing field decisions and Change Orders.

- 5. Procedures for processing Applications for Payment.
- 6. Distribution of Contract Documents.
- 7. Submittal of Shop Drawings, Product Data, and Samples.
- 8. Preparation of record documents.
- 9. Use of the premises.
- 10. Parking availability.
- 11. Office, work, and storage areas.
- 12. Equipment deliveries and priorities.
- 13. Safety procedures.
- 14. First aid.
- 15. Security.
- 16. Housekeeping.
- 17. Working hours.
- 18. Procedures for dealing with residents and on-site management.
- D. Record significant discussions and agreements and disagreements of each conference, and the approved schedule. Promptly distribute the record of the meeting to everyone concerned, including the Owner, Owner's Representative and the Architect.

1.4 PRE-INSTALLATION CONFERENCES

- A. Conduct a pre-installation conference at the Project Site before each of the following construction activities, some of which requires coordination with other construction:
 - 1. Demolition.
 - 2. Floor Covering.
 - 3. Painting.
- B. Attendees: The Installer and representatives of manufacturers and fabricators involved in or affected by the installation, and its coordination or integration with other materials and installations and roughins that have preceded or will follow, shall attend the meeting. Schedule pre-installation conference with Architect and Owner's Representative at least three (3) days prior to commencement of construction activity.
 - 1. Review the progress of other construction activities and preparations for the particular activity under consideration at each preinstallation conference, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related Change Order Proposals.
 - d. Purchases.
 - e. Deliveries.
 - f. Shop Drawings, Product Data, and quality-control samples.
 - g. Review of mockups.
 - h. Review of installation requirements.
 - i. Possible conflicts.
 - j. Compatibility problems.
 - k. Time schedules.

- I. Weather limitations.
- m. Manufacturer's recommendations.
- n. Warranty requirements.
- o. Compatibility of materials.
- p. Acceptability of substrates.
- q. Temporary facilities.
- r. Space and access limitations.
- s. Governing regulations.
- t. Safety.
- u. Inspecting and testing requirements.
- v. Required performance results.
- w. Recording requirements.
- x. Protection.
- 2. Record significant discussions and agreements and disagreements of each conference, and the approved schedule. Promptly distribute the record of the meeting to everyone concerned, including the Owner, Owner's Representative and the Architect.
- 3. Do not proceed with the installation if the conference cannot be held or successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene the conference at the earliest feasible date.
- 4. Work and construction activities that commence or proceeds without a pre-installation conference with the Architect and Owner's Representative are subject to removal and re-installation per Contract requirements at Contractor's expense.

1.5 PROGRESS MEETINGS

- A. Conduct progress meetings at the Project Site at regular intervals required by the Division of Construction Management. Notify the Owner's Representative and the Architect at least one week in advance of scheduled meeting dates. Coordinate dates of meetings with preparation of the payment request.
- B. Attendees: In addition to representatives of the Owner and the Architect, each subcontractor, supplier, or other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.
- C. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the status of the Project.
 - 1. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule referred to in the Agreement, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to insure that current and subsequent activities will be completed within the Contract Time.
 - 2. Review the present and future needs of each entity present, including the following:
 - a. Interface requirements.

- b. Time.
- c. Sequences.
- d. Status of submittals.
- e. Deliveries.
- f. Off-site fabrication problems.
- g. Access.
- h. Site utilization.
- i. Temporary facilities and services.
- j. Hours of work.
- k. Hazards and risks.
- I. Housekeeping.
- m. Quality and work standards.
- n. Change Orders.
- o. Documentation of information for payment requests.
- D. Reporting: No later than 3 days after each meeting, distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
 - 1. Schedule Updating: Revise the Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized by Change Order. Issue the revised schedule concurrently with the report of each meeting.
 - 2. Submit notes on Division of Construction Management form B-10 Statement of Field Observations.

1.6 COORDINATION MEETINGS

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

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Startup construction schedule.
 - 2. Contractor's Construction Schedule.
 - 3. Construction schedule updating reports.
 - 4. Daily construction reports.
 - 5. Material location reports.
 - 6. Site condition reports.
 - 7. Unusual event reports.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction Project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. Cost Loading: The allocation of the schedule of values for completing an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum.
- C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- E. Event: The starting or ending point of an activity.

- F. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
 - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- G. Resource Loading: The allocation of manpower and equipment necessary for completing an activity as scheduled.

1.4 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. Working electronic copy of schedule file, where indicated.
 - 2. PDF file.
- B. Startup construction schedule.
 - 1. Submittal of cost-loaded, startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.
- C. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.
- D. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
 - 1. Submit a working digital copy of schedule, using software indicated, and labeled to comply with requirements for submittals.
- E. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
 - 1. Activity Report: List of activities sorted by activity number and then early start date, or actual start date if known.
 - 2. Logic Report: List of preceding and succeeding activities for each activity, sorted in ascending order by activity number and then by early start date, or actual start date if known.
 - 3. Total Float Report: List of activities sorted in ascending order of total float.
 - 4. Earnings Report: Compilation of Contractor's total earnings from the Notice to Proceed until most recent Application for Payment.
- F. Construction Schedule Updating Reports: Submit with Applications for Payment.

- G. Daily Construction Reports: Submit at weekly intervals.
- H. Site Condition Reports: Submit at time of discovery of differing conditions.
- I. Unusual Event Reports: Submit at time of unusual event.
- J. Qualification Data: For scheduling consultant.

1.5 COORDINATION

- A. Coordinate Contractor's Construction Schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

1.6 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each floor or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
 - 1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
 - 2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 30 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 - 3. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with submittal schedule.
 - 4. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
 - 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
 - 6. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.

- C. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.
- D. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
 - 1. Unresolved issues.
 - 2. Unanswered Requests for Information.
 - 3. Rejected or unreturned submittals.
 - 4. Notations on returned submittals.
 - 5. Pending modifications affecting the Work and the Contract Time.
- E. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, equipment required to achieve compliance, and date by which recovery will be accomplished.

1.7 GANTT-CHART SCHEDULE REQUIREMENTS

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-charttype, Contractor's Construction Schedule within 14 days of date established for the Notice to Proceed.
 - 1. Base schedule on the startup construction schedule and additional information received since the start of Project.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
 - 1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

1.8 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 - 1. List of subcontractors at Project site.
 - 2. Approximate count of personnel at Project site.
 - 3. Equipment at Project site.
 - 4. Material deliveries.
 - 5. High and low temperatures and general weather conditions, including presence of rain or snow.

- 6. Accidents.
- 7. Meetings and significant decisions.
- 8. Unusual events.
- 9. Stoppages, delays, shortages, and losses.
- 10. Meter readings and similar recordings.
- 11. Emergency procedures.
- 12. Orders and requests of authorities having jurisdiction.
- 13. Change Orders received and implemented.
- 14. Construction Change Directives received and implemented.
- 15. Services connected and disconnected.
- 16. Equipment or system tests and startups.
- 17. Partial completions and occupancies.
- 18. Substantial Completions authorized.
- B. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

1.2 DEFINITIONS

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

1.3 ACTION SUBMITTALS

A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's Digital Data Files: Electronic copies of digital data files of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals.
 - 1. Architect will furnish Contractor one set of digital drawing files of the Contract Plan Drawings for use in preparing Shop Drawings and Project record drawings.
 - a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
 - b. Contractor shall execute a data licensing agreement in the form of an Agreement form acceptable to Owner and provided by the Architect.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

- 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
- 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 - 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
- D. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
 - 1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 - 2. Name file with submittal number or other unique identifier, including revision identifier.
 - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., MPL-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., MPL-061000.01.A).
 - 3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
 - 4. Transmittal Form for Electronic Submittals: Use electronic form provided in a PDF format acceptable to Owner, containing the following information:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name of Contractor.
 - e. Name of firm or entity that prepared submittal.
 - f. Names of subcontractor, manufacturer, and supplier.
 - g. Category and type of submittal.
 - h. Submittal purpose and description.
 - i. Specification Section number and title.

- j. Specification paragraph number or drawing designation and generic name for each of multiple items.
- k. Drawing number and detail references, as appropriate.
- I. Location(s) where product is to be installed, as appropriate.
- m. Related physical samples submitted directly.
- n. Indication of full or partial submittal.
- o. Transmittal number, numbered consecutively.
- p. Submittal and transmittal distribution record.
- q. Other necessary identification.
- r. Remarks.
- 5. Metadata: Include the following information as keywords in the electronic submittal file metadata:
 - a. Project name.
 - b. Number and title of appropriate Specification Section.
 - c. Manufacturer name.
 - d. Product name.
- E. Options: Identify options requiring selection by Architect.
- F. Deviations: Identify deviations from the Contract Documents on submittals.
- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 - 1. Note date and content of previous submittal.
 - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 - 3. Resubmit submittals until they are marked with "No Exceptions taken" notation from Architect's action stamp.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with "No Exceptions taken" notation from Architect's action stamp.

PART 2 - PRODUCTS

- 2.1 SUBMITTAL PROCEDURES
 - A. General Submittal Procedure Requirements:
 - 1. Submit electronic submittals via email: <u>lkthorton@fuquaarchitechs.com</u> as PDF electronic files.

- a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
- 2. Action Submittals: When unable to submit via electronic means, submit four paper copies of each submittal unless otherwise indicated. Architect will return two copies.
- 3. Informational Submittals: When unable to submit via electronic means, submit two paper copies of each submittal unless otherwise indicated. Architect will not return copies.
- 4. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a digital signature with digital certificate on electronically-submitted certificates and certifications where indicated.
 - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 - 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 - 5. Submit Product Data before or concurrent with Samples.
 - 6. Submit Product Data in the following format:
 - a. PDF electronic file.

- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
 - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 - 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 24x36 size sheets.
 - 3. Submit Shop Drawings in the following format:
 - a. PDF electronic file.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
 - 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 - 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 - 3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
 - 4. Disposition: Maintain sets of approved Samples at Project site, available for qualitycontrol comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

- 5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit two full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
- 6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit three sets of Samples. Architect will retain **two** Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record sample.
 - 1) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 - 1. Submit product schedule in the following format:
 - a. PDF electronic file.
- F. Coordination Drawings Submittals: Comply with requirements specified in Division 01 "Project Management and Coordination."
- G. Contractor's Construction Schedule: Comply with requirements specified in Division 01 "Construction Progress Documentation."
- H. Application for Payment and Schedule of Values: Comply with requirements specified in Division 01 "Payment Procedures."
- I. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Division 01 "Quality Requirements."
- J. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 "Closeout Procedures."
- K. Maintenance Data: Comply with requirements specified in Division 01 "Operation and Maintenance Data."

- L. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- M. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- N. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- O. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- P. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- Q. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- R. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- S. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- T. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.
- U. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 "Quality Requirements."
- V. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- W. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

- X. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- Y. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF electronic file and three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Division 01 "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action. A Contractor's stamp indicating that contractor has "reviewed" the submittal does not constitute an approval.
- B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specified tests, inspections, and related actions do not limit Contractor's other qualityassurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 2. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner or authorities having jurisdiction are not limited by provisions of this Section.
 - 3. Specific test and inspection requirements are not specified in this Section.

1.2 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.
- C. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
- D. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- E. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- F. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

- G. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- H. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- I. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of **five** previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.3 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.4 INFORMATIONAL SUBMITTALS

- A. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:
 - 1. Seismic-force-resisting system, designated seismic system, or component listed in the designated seismic system quality-assurance plan (when applicable).
 - 2. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan (when applicable).
- B. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

1.5 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 - 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 - 12. Name and signature of laboratory inspector.
 - 13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Field Reports: Prepare written information documenting tests and inspections specified in other Sections. Include the following:
 - 1. Name, address, and telephone number of representative making report.
 - 2. Statement on condition of substrates and their acceptability for installation of product.
 - 3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 - 4. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 - 5. Other required items indicated in individual Specification Sections.
- C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.6 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or products that are similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to **ASTM E 329**; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
 - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Manufacturer's Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
 - 1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - d. When testing is complete, remove test specimens, assemblies, and mockups; do not reuse products on Project.
 - 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect with copy to Contractor. Interpret tests

and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

1.7 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
 - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 - 2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
 - 1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 - 2. Notify testing agencies at least **36** hours in advance of time when Work that requires testing or inspecting will be performed.
 - 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 - 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 - 5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a manufacturer's representative to observe and inspect the Work. Manufacturer's representative's services include examination of substrates and conditions, verification of materials, inspection of completed portions of the Work, and submittal of written reports.
- D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
 - 1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.

- 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
- 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
- 4. Submit a certified written report, in duplicate, of each test, inspection, and similar qualitycontrol service through Contractor.
- 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
- 6. Do not perform any duties of Contractor.
- F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
 - 1. Access to the Work.
 - 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 - 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 - 4. Facilities for storage and field curing of test samples.
 - 5. Delivery of samples to testing agencies.
 - 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 - 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
 - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 - 1. Date test or inspection was conducted.
 - 2. Description of the Work tested or inspected.
 - 3. Date test or inspection results were transmitted to Architect.
 - 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.
3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as

if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
 - 1. AABC Associated Air Balance Council; <u>www.aabc.com</u>.
 - 2. AAMA American Architectural Manufacturers Association; <u>www.aamanet.org</u>.
 - 3. AAPFCO Association of American Plant Food Control Officials; <u>www.aapfco.org</u>.
 - 4. AASHTO American Association of State Highway and Transportation Officials; www.transportation.org.
 - 5. AATCC American Association of Textile Chemists and Colorists; <u>www.aatcc.org</u>.
 - 6. ABMA American Bearing Manufacturers Association; www.americanbearings.org.
 - 7. ABMA American Boiler Manufacturers Association; www.abma.com.
 - 8. ACI American Concrete Institute; (Formerly: ACI International); www.concrete.org
 - 9. ACPA American Concrete Pipe Association; <u>www.concrete-pipe.org</u>.
 - 10. AEIC Association of Edison Illuminating Companies, Inc. (The); <u>www.aeic.org</u>.
 - 11. AF&PA American Forest & Paper Association; <u>www.afandpa.org</u>.
 - 12. AGA American Gas Association; www.aga.org.
 - 13. AHAM Association of Home Appliance Manufacturers; www.aham.org.
 - 14. AHRI Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
 - 15. Al Asphalt Institute; www.asphaltinstitute.org.
 - 16. AIA American Institute of Architects (The); www.aia.org.
 - 17. AISC American Institute of Steel Construction; <u>www.aisc.org</u>.
 - 18. AISI American Iron and Steel Institute; <u>www.steel.org</u>.
 - 19. AITC American Institute of Timber Construction; www.aitc-glulam.org.
 - 20. AMCA Air Movement and Control Association International, Inc.; www.amca.org.
 - 21. ANSI American National Standards Institute; <u>www.ansi.org</u>.

- 22. AOSA Association of Official Seed Analysts, Inc.; <u>www.aosaseed.com</u>.
- 23. APA APA The Engineered Wood Association; www.apawood.org.
- 24. APA Architectural Precast Association; www.archprecast.org.
- 25. API American Petroleum Institute; <u>www.api.org</u>.
- 26. ARI Air-Conditioning & Refrigeration Institute; (See AHRI).
- 27. ARI American Refrigeration Institute; (See AHRI).
- 28. ARMA Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
- 29. ASCE American Society of Civil Engineers; <u>www.asce.org</u>.
- 30. ASCE/SEI American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).
- 31. ASHRAE American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.
- 32. ASME ASME International; (American Society of Mechanical Engineers); www.asme.org.
- 33. ASSE American Society of Safety Engineers (The); www.asse.org.
- 34. ASSE American Society of Sanitary Engineering; <u>www.asse-plumbing.org</u>.
- 35. ASTM ASTM International; <u>www.astm.org</u>.
- 36. ATIS Alliance for Telecommunications Industry Solutions; www.atis.org.
- 37. AWEA American Wind Energy Association; <u>www.awea.org</u>.
- 38. AWI Architectural Woodwork Institute; <u>www.awinet.org</u>.
- 39. AWMAC Architectural Woodwork Manufacturers Association of Canada; <u>www.awmac.com</u>.
- 40. AWPA American Wood Protection Association; www.awpa.com.
- 41. AWS American Welding Society; <u>www.aws.org</u>.
- 42. AWWA American Water Works Association; <u>www.awwa.org</u>.
- 43. BHMA Builders Hardware Manufacturers Association; www.buildershardware.com.
- 44. BIA Brick Industry Association (The); www.gobrick.com.
- 45. BICSI BICSI, Inc.; <u>www.bicsi.org</u>.
- 46. BIFMA BIFMA International; (Business and Institutional Furniture Manufacturer's Association); www.bifma.org.
- 47. BISSC Baking Industry Sanitation Standards Committee; www.bissc.org.
- 48. BWF Badminton World Federation; (Formerly: International Badminton Federation); www.bissc.org.
- 49. CDA Copper Development Association; <u>www.copper.org</u>.
- 50. CE Conformite Europeenne; <u>http://ec.europa.eu/growth/single-market/ce-marking/</u>
- 51. CEA Canadian Electricity Association; <u>www.electricity.ca</u>.
- 52. CEA Consumer Electronics Association; <u>www.ce.org</u>.
- 53. CFFA Chemical Fabrics and Film Association, Inc.; www.chemicalfabricsandfilm.com.
- 54. CFSEI Cold-Formed Steel Engineers Institute; www.cfsei.org.
- 55. CGA Compressed Gas Association; <u>www.cganet.com</u>.
- 56. CIMA Cellulose Insulation Manufacturers Association; www.cellulose.org.
- 57. CISCA Ceilings & Interior Systems Construction Association; <u>www.cisca.org</u>.
- 58. CISPI Cast Iron Soil Pipe Institute; <u>www.cispi.org</u>.
- 59. CLFMI Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
- 60. CPA Composite Panel Association; www.pbmdf.com.
- 61. CRI Carpet and Rug Institute (The); www.carpet-rug.org.
- 62. CRRC Cool Roof Rating Council; <u>www.coolroofs.org</u>.

- 63. CRSI Concrete Reinforcing Steel Institute; www.crsi.org.
- 64. CSA CSA Group; www.csa.ca.
- 65. CSA CSA International; (Formerly: IAS International Approval Services); <u>www.csa-</u> international.org.
- 66. CSI Construction Specifications Institute (The); <u>www.csinet.org</u>.
- 67. CSSB Cedar Shake & Shingle Bureau; <u>www.cedarbureau.org</u>.
- 68. CTI Cooling Technology Institute; (Formerly: Cooling Tower Institute); www.cti.org.
- 69. CWC Composite Wood Council; (See CPA).
- 70. DASMA Door and Access Systems Manufacturers Association; <u>www.dasma.com</u>.
- 71. DHI Door and Hardware Institute; <u>www.dhi.org</u>.
- 72. ECA Electronic Components Association; (See ECIA).
- 73. ECAMA Electronic Components Assemblies & Materials Association; (See ECIA).
- 74. ECIA Electronic Components Industry Association; www.eciaonline.org.
- 75. EIA Electronic Industries Alliance; (See TIA).
- 76. EIMA EIFS Industry Members Association; www.eima.com.
- 77. EJMA Expansion Joint Manufacturers Association, Inc.; <u>www.ejma.org</u>.
- 78. ESD ESD Association; (Electrostatic Discharge Association); <u>www.esda.org</u> .
- 79. ESTA Entertainment Services and Technology Association; (See PLASA).
- 80. ETL Intertek (See Intertek); <u>www.intertek.com</u>.
- 81. EVO Efficiency Valuation Organization; <u>www.evo-world.org</u>.
- 82. FCI Fluid Controls Institute; www.fluidcontrolsinstitute.org.
- 83. FIBA Federation Internationale de Basketball; (The International Basketball Federation); www.fiba.com.
- 84. FIVB Federation Internationale de Volleyball; (The International Volleyball Federation); <u>www.fivb.org</u>.
- 85. FM Approvals FM Approvals LLC; <u>www.fmglobal.com</u>.
- 86. FM Global FM Global; (Formerly: FMG FM Global); www.fmglobal.com.
- 87. FRSA Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.; www.floridaroof.com.
- 88. FSA Fluid Sealing Association; www.fluidsealing.com.
- 89. FSC Forest Stewardship Council U.S.; www.fscus.org.
- 90. GA Gypsum Association; www.gypsum.org.
- 91. GANA Glass Association of North America; www.glasswebsite.com.
- 92. GS Green Seal; <u>www.greenseal.org</u>.
- 93. HI Hydraulic Institute; <u>www.pumps.org</u>.
- 94. HI/GAMA Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
- 95. HMMA Hollow Metal Manufacturers Association; (See NAAMM).
- 96. HPVA Hardwood Plywood & Veneer Association; www.hpva.org.
- 97. HPW H. P. White Laboratory, Inc.; <u>www.hpwhite.com</u>.
- 98. IAPSC International Association of Professional Security Consultants; <u>www.iapsc.org</u>.
- 99. IAS International Accreditation Service; <u>www.iasonline.org</u>.
- 100. IAS International Approval Services; (See CSA).
- 101. ICBO International Conference of Building Officials; (See ICC).
- 102. ICC International Code Council; www.iccsafe.org.
- 103. ICEA Insulated Cable Engineers Association, Inc.; www.icea.net.
- 104. ICPA International Cast Polymer Alliance; <u>www.icpa-hq.org</u>.

- 105. ICRI International Concrete Repair Institute, Inc.; www.icri.org.
- 106. IEC International Electrotechnical Commission; <u>www.iec.ch</u>.
- 107. IEEE Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
- 108. IES Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); <u>www.ies.org</u>.
- 109. IESNA Illuminating Engineering Society of North America; (See IES).
- 110. IEST Institute of Environmental Sciences and Technology; www.iest.org.
- 111. IGMA Insulating Glass Manufacturers Alliance; www.igmaonline.org.
- 112. IGSHPA International Ground Source Heat Pump Association; www.igshpa.okstate.edu.
- 113. ILI Indiana Limestone Institute of America, Inc.; <u>www.iliai.com</u>.
- 114. Intertek Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); www.intertek.com.
- 115. ISA International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); www.isa.org.
- 116. ISAS Instrumentation, Systems, and Automation Society (The); (See ISA).
- 117. ISFA International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); <u>www.isfanow.org</u>.
- 118. ISO International Organization for Standardization; www.iso.org.
- 119. ISSFA International Solid Surface Fabricators Association; (See ISFA).
- 120. ITU International Telecommunication Union; www.itu.int/home.
- 121. KCMA Kitchen Cabinet Manufacturers Association; www.kcma.org.
- 122. LMA Laminating Materials Association; (See CPA).
- 123. LPI Lightning Protection Institute; www.lightning.org.
- 124. MBMA Metal Building Manufacturers Association; www.mbma.com.
- 125. MCA Metal Construction Association; www.metalconstruction.org.
- 126. MFMA Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
- 127. MFMA Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
- 128. MHIA Material Handling Industry of America; www.mhia.org.
- 129. MIA Marble Institute of America; www.marble-institute.com.
- 130. MMPA Moulding & Millwork Producers Association; www.wmmpa.com.
- 131. MPI Master Painters Institute; <u>www.paintinfo.com</u>.
- 132. MSS Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; www.mss-hq.org.
- 133. NAAMM National Association of Architectural Metal Manufacturers; <u>www.naamm.org</u>.
- 134. NACE NACE International; (National Association of Corrosion Engineers International); www.nace.org.
- 135. NADCA National Air Duct Cleaners Association; <u>www.nadca.com</u>.
- 136. NAIMA North American Insulation Manufacturers Association; <u>www.naima.org</u>.
- 137. NBGQA National Building Granite Quarries Association, Inc.; www.nbgqa.com.
- 138. NBI New Buildings Institute; www.newbuildings.org.
- 139. NCAA National Collegiate Athletic Association (The); www.ncaa.org.
- 140. NCMA National Concrete Masonry Association; www.ncma.org.
- 141. NEBB National Environmental Balancing Bureau; www.nebb.org.
- 142. NECA National Electrical Contractors Association; www.necanet.org.
- 143. NeLMA Northeastern Lumber Manufacturers Association; www.nelma.org.
- 144. NEMA National Electrical Manufacturers Association; www.nema.org.
- 145. NETA InterNational Electrical Testing Association; www.netaworld.org.

- 146. NFHS National Federation of State High School Associations; www.nfhs.org.
- 147. NFPA National Fire Protection Association; www.nfpa.org.
- 148. NFPA NFPA International; (See NFPA).
- 149. NFRC National Fenestration Rating Council; www.nfrc.org.
- 150. NHLA National Hardwood Lumber Association; www.nhla.com.
- 151. NLGA National Lumber Grades Authority; www.nlga.org.
- 152. NOFMA National Oak Flooring Manufacturers Association; (See NWFA).
- 153. NOMMA National Ornamental & Miscellaneous Metals Association; www.nomma.org.
- 154. NRCA National Roofing Contractors Association; www.nrca.net.
- 155. NRMCA National Ready Mixed Concrete Association; www.nrmca.org.
- 156. NSF NSF International; <u>www.nsf.org</u>.
- 157. NSPE National Society of Professional Engineers; www.nspe.org.
- 158. NSSGA National Stone, Sand & Gravel Association; www.nssga.org.
- 159. NTMA National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
- 160. NWFA National Wood Flooring Association; www.nwfa.org.
- 161. PCI Precast/Prestressed Concrete Institute; www.pci.org.
- 162. PDI Plumbing & Drainage Institute; <u>www.pdionline.org</u>.
- 163. PLASA PLASA; (Formerly: ESTA Entertainment Services and Technology Association); http://www.plasa.org.
- 164. RCSC Research Council on Structural Connections; www.boltcouncil.org.
- 165. RFCI Resilient Floor Covering Institute; www.rfci.com.
- 166. RIS Redwood Inspection Service; www.redwoodinspection.com.
- 167. SAE SAE International; <u>www.sae.org</u>.
- 168. SCTE Society of Cable Telecommunications Engineers; www.scte.org.
- 169. SDI Steel Deck Institute; www.sdi.org.
- 170. SDI Steel Door Institute; www.steeldoor.org.
- 171. SEFA Scientific Equipment and Furniture Association (The); www.sefalabs.com.
- 172. SEI/ASCE Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
- 173. SIA Security Industry Association; www.siaonline.org.
- 174. SJI Steel Joist Institute; www.steeljoist.org.
- 175. SMA Screen Manufacturers Association; www.smainfo.org.
- 176. SMACNA Sheet Metal and Air Conditioning Contractors' National Association; <u>www.smacna.org</u>.
- 177. SMPTE Society of Motion Picture and Television Engineers; www.smpte.org.
- 178. SPFA Spray Polyurethane Foam Alliance; www.sprayfoam.org.
- 179. SPIB Southern Pine Inspection Bureau; www.spib.org.
- 180. SPRI Single Ply Roofing Industry; <u>www.spri.org</u>.
- 181. SRCC Solar Rating & Certification Corporation; www.solar-rating.org.
- 182. SSINA Specialty Steel Industry of North America; www.ssina.com.
- 183. SSPC SSPC: The Society for Protective Coatings; www.sspc.org.
- 184. STI Steel Tank Institute; <u>www.steeltank.com</u>.
- 185. SWI Steel Window Institute; <u>www.steelwindows.com</u>.
- 186. SWPA Submersible Wastewater Pump Association; www.swpa.org.
- 187. TCA Tilt-Up Concrete Association; www.tilt-up.org.
- 188. TCNA Tile Council of North America, Inc.; www.tileusa.com.
- 189. TEMA Tubular Exchanger Manufacturers Association, Inc.; www.tema.org.

- 190. TIA Telecommunications Industry Association (The); (Formerly: TIA/EIA Telecommunications Industry Association/Electronic Industries Alliance); www.tiaonline.org.
- 191. TIA/EIA Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
- 192. TMS The Masonry Society; <u>www.masonrysociety.org</u>.
- 193. TPI Truss Plate Institute; <u>www.tpinst.org</u>.
- 194. TPI Turfgrass Producers International; www.turfgrasssod.org.
- 195. TRI Tile Roofing Institute; www.tileroofing.org.
- 196. UL Underwriters Laboratories Inc.; <u>http://www.ul.com</u>.
- 197. UNI Uni-Bell PVC Pipe Association; www.uni-bell.org.
- 198. USAV USA Volleyball; www.usavolleyball.org.
- 199. USGBC U.S. Green Building Council; www.usgbc.org.
- 200. USITT United States Institute for Theatre Technology, Inc.; www.usitt.org.
- 201. WA Wallcoverings Association; www.wallcoverings.org
- 202. WASTEC Waste Equipment Technology Association; www.wastec.org.
- 203. WCLIB West Coast Lumber Inspection Bureau; www.wclib.org.
- 204. WCMA Window Covering Manufacturers Association; www.wcmanet.org.
- 205. WDMA Window & Door Manufacturers Association; www.wdma.com.
- 206. WI Woodwork Institute; <u>www.wicnet.org</u>.
- 207. WSRCA Western States Roofing Contractors Association; <u>www.wsrca.com</u>.
- 208. WWPA Western Wood Products Association; www.wwpa.org.
- C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.
 - 1. DIN Deutsches Institut fur Normung e.V.; www.din.de.
 - 2. IAPMO International Association of Plumbing and Mechanical Officials; www.iapmo.org.
 - 3. ICC International Code Council; <u>www.iccsafe.org</u>.
 - 4. ICC-ES ICC Evaluation Service, LLC; <u>www.icc-es.org</u>.
- D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.
 - 1. COE Army Corps of Engineers; <u>www.usace.army.mil</u>.
 - 2. CPSC Consumer Product Safety Commission; <u>www.cpsc.gov</u>.
 - 3. DOC Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
 - 4. DOD Department of Defense; <u>www.quicksearch.dla.mil</u>.
 - 5. DOE Department of Energy; <u>www.energy.gov</u>.
 - 6. EPA Environmental Protection Agency; <u>www.epa.gov</u>.
 - 7. FAA Federal Aviation Administration; <u>www.faa.gov</u>.
 - 8. FG Federal Government Publications; <u>www.gpo.gov/fdsys</u>.
 - 9. GSA General Services Administration; <u>www.gsa.gov</u>.
 - 10. HUD Department of Housing and Urban Development; <u>www.hud.gov</u>.

- 11. LBL Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; <u>www.eetd.lbl.gov</u>.
- 12. OSHA Occupational Safety & Health Administration; <u>www.osha.gov</u>.
- 13. SD Department of State; <u>www.state.gov</u>.
- 14. TRB Transportation Research Board; National Cooperative Highway Research Program; The National Academies; <u>www.trb.org</u>.
- 15. USDA Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
- 16. USDA Department of Agriculture; Rural Utilities Service; www.usda.gov.
- 17. USDOJ Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.
- 18. USP U.S. Pharmacopeial Convention; www.usp.org.
- 19. USPS United States Postal Service; <u>www.usps.com</u>.
- E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
 - 1. CFR Code of Federal Regulations; Available from Government Printing Office; www.gpo.gov/fdsys.
 - 2. DOD Department of Defense; Military Specifications and Standards; Available from DLA Document Services; www.quicksearch.dla.mil.
 - 3. DSCC Defense Supply Center Columbus; (See FS).
 - 4. FED-STD Federal Standard; (See FS).
 - 5. FS Federal Specification; Available from DLA Document Services; <u>www.quicksearch.dla.mil</u>.
 - a. Available from Defense Standardization Program; <u>www.dsp.dla.mil</u>.
 - b. Available from General Services Administration; <u>www.gsa.gov</u>.
 - c. Available from National Institute of Building Sciences/Whole Building Design Guide; <u>www.wbdg.org/ccb</u>.
 - 6. MILSPEC Military Specification and Standards; (See DOD).
 - 7. USAB United States Access Board; <u>www.access-board.gov</u>.
 - 8. USATBCB U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).
- F. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
 - 1. CBHF; State of California; Department of Consumer Affairs; Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation; www.bearhfti.ca.gov.
 - 2. CCR; California Code of Regulations; Office of Administrative Law; California Title 24 Energy Code; <u>www.calregs.com</u>.
 - 3. CDHS; California Department of Health Services; (See CDPH).

- 4. CDPH; California Department of Public Health; Indoor Air Quality Program; www.cal-iaq.org.
- 5. CPUC; California Public Utilities Commission; <u>www.cpuc.ca.gov</u>.
- 6. SCAQMD; South Coast Air Quality Management District; www.aqmd.gov.
- 7. TFS; Texas A&M Forest Service; Sustainable Forestry and Economic Development; www.txforestservice.tamu.edu.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

1.3 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.
- B. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

- A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.
- B. Implementation and Termination Schedule: Within 15 days of date established for commencement of the Work, submit schedule indicating implementation and termination dates of each temporary utility.
- C. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.

- D. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- E. Moisture- and Mold-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage and mold.
- F. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Include the following:
 - 1. Locations of dust-control partitions at each phase of work.
 - 2. HVAC system isolation schematic drawing.
 - 3. Location of proposed air-filtration system discharge.
 - 4. Waste-handling procedures.
 - 5. Other dust-control measures.

1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in the United States Access Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.6 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, Construction Manager, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:

- C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
 - 1. Store combustible materials apart from building.

2.2 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 - 2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
 - 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction.
- C. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with fourstage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

- A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
 - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

3.2 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
 - 1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.3 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
 - 1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.
- C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.
- D. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- E. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- F. Temporary Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- G. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
- H. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
 - 1. Install electric power service underground unless otherwise indicated.
- I. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
 - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
- J. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install and-based telephone line(s) for each field office.

- 1. At each telephone, post a list of important telephone numbers.
 - a. Police and fire departments.
 - b. Ambulance service.
 - c. Contractor's home office.
 - d. Contractor's emergency after-hours telephone number.
 - e. Architect's office.
 - f. Engineers' offices.
 - g. Owner's office.
 - h. Principal subcontractors' field and home offices.
- K. Electronic Communication Service: Provide a desktop computer in the primary field office adequate for use by Architect and Owner to access Project electronic documents and maintain electronic communications. Equip computer with not less than the following:
 - 1. Processor: Intel Core i5 or i7.
 - 2. Memory: 4 gigabyte.
 - 3. Disk Storage: 500 gigabyte hard-disk drive and combination DVD-RW/CD-RW drive.
 - 4. Display: 24-inch (610-mm) LCD monitor with 256-Mb dedicated video RAM.
 - 5. Full-size keyboard and mouse.
 - 6. Network Connectivity: 10/100BaseT Ethernet.
 - 7. Productivity Software:
 - a. Microsoft Office Professional, 2010 or higher, including Word, Excel, and Outlook.
 - b. Adobe Reader 11.0 or higher.
 - c. WinZip 7.0 or higher.
 - 8. Printer: "All-in-one" unit equipped with printer server, combining color printing, photocopying, scanning, and faxing, or separate units for each of these three functions.
 - 9. Internet Service: Broadband modem, router and ISP, equipped with hardware firewall, providing minimum 1.0 Mbps upload and 15 Mbps download speeds at each computer.
 - 10. Internet Security: Integrated software, providing software firewall, virus, spyware, phishing, and spam protection in a combined application.

3.4 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
 - 1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet (9 m) of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
 - 2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after

Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

- B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas as indicated on Drawings.
 - 1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.
- C. Temporary Use of Planned Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.
 - 1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
 - 2. Prepare subgrade and install subbase and base for temporary roads and paved areas according to Section 312000 "Earth Moving."
 - 3. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.
 - 4. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course according to Section 321216 "Asphalt Paving."
- D. Traffic Controls: Comply with requirements of authorities having jurisdiction.
 - 1. Protect existing site improvements to remain including curbs, pavement, and utilities.
 - 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- E. Parking: Provide temporary parking areas for construction personnel.
- F. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
 - 1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
 - 2. Remove snow and ice as required to minimize accumulations.
- G. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
 - 1. Identification Signs: Provide Project identification signs as indicated on Drawings.
 - 2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
 - a. Provide temporary, directional signs for construction personnel and visitors.

- 3. Maintain and touch up signs so they are legible at all times.
- H. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Retain "Lifts and Hoists" Paragraph below for construction of more than two stories.
- I. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
 - 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
 - 1. Comply with work restrictions specified in Section 011000 "Summary."
- B. Temporary Erosion and Sedimentation Control: Comply with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
- C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
 - 1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant-protection zones.
 - 2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
 - 3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
 - 4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- E. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- F. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at

Substantial Completion. Perform control operations lawfully, using materials approved by authorities having jurisdiction.

- G. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- H. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
 - 1. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
 - 2. Insulate partitions to control noise transmission to occupied areas.
 - 3. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
 - 4. Protect air-handling equipment.
 - 5. Provide walk-off mats at each entrance through temporary partition.

3.6 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Describe delivery, handling, storage, installation, and protection provisions for materials subject to water absorption or water damage.
 - 1. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
 - 2. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
 - 3. Indicate methods to be used to avoid trapping water in finished work.
- B. Exposed Construction Period: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
 - 1. Protect porous materials from water damage.
 - 2. Protect stored and installed material from flowing or standing water.
 - 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 - 4. Remove standing water from decks.
 - 5. Keep deck openings covered or dammed.
- C. Partially Enclosed Construction Period: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
 - 1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 - 2. Keep interior spaces reasonably clean and protected from water damage.

- 3. Periodically collect and remove waste containing cellulose or other organic matter.
- 4. Discard or replace water-damaged material.
- 5. Do not install material that is wet.
- 6. Discard and replace stored or installed material that begins to grow mold.
- 7. Perform work in a sequence that allows wet materials adequate time to dry before enclosing the material in gypsum board or other interior finishes.
- D. Controlled Construction Period: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
 - 1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
 - 2. Use temporary or permanent HVAC system to control humidity within ranges specified for installed and stored materials.
 - 3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
 - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective and require replacing.
 - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
 - c. Remove and replace materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.7 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
 - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

- 1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
- 2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
- 3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Section 012500 "Substitution Procedures" for requests for substitutions.
 - 2. Section 014200 "References" for applicable industry standards for products specified.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved by Architect through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification.

C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications. Submit a comparable product request, if applicable.

1.4 ACTION SUBMITTALS

- A. Comparable Product Request Submittal: Submit request for consideration of each comparable product. Identify basis-of-design product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
 - 2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
 - a. Form of Architect's Approval of Submittal: As specified in Section 013300 "Submittal Procedures."
 - b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 013300 "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
 - 1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
 - 2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.
- B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.

- 1. Labels: Locate required product labels and stamps on a concealed surface, or, where required for observation following installation, on a visually accessible surface that is not conspicuous.
- 2. Equipment Nameplates: Provide a permanent nameplate on each item of serviceconnected or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:
 - a. Name of product and manufacturer.
 - b. Model and serial number.
 - c. Capacity.
 - d. Speed.
 - e. Ratings.
- 3. See individual identification sections in Divisions 21, 22, 23, and 26 for additional identification requirements.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
- C. Storage:
 - 1. Store products to allow for inspection and measurement of quantity or counting of units.
 - 2. Store materials in a manner that will not endanger Project structure.
 - 3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
 - 4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
 - 5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.

- 6. Protect stored products from damage and liquids from freezing.
- 7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 - 1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 - 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 - 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 - 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 - 3. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 - 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 - 3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
 - 4. Where products are accompanied by the term "as selected," Architect will make selection.
 - 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

- 6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
 - a. Submit additional documentation required by Architect in order to establish equivalency of proposed products. Evaluation of "or equal" product status is by the Architect, whose determination is final.
- B. Product Selection Procedures:
 - 1. Sole Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - a. Sole product may be indicated by the phrase: "Subject to compliance with requirements, provide the following: ..."
 - 2. Sole Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - a. Sole manufacturer/source may be indicated by the phrase: "Subject to compliance with requirements, provide products by the following: ..."
 - 3. Limited List of Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered unless otherwise indicated.
 - a. Limited list of products may be indicated by the phrase: "Subject to compliance with requirements, provide one of the following: ..."
 - 4. Non-Limited List of Products: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, which complies with requirements.
 - a. Non-limited list of products is indicated by the phrase: "Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following: ..."
 - 5. Limited List of Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered unless otherwise indicated.
 - a. Limited list of manufacturers is indicated by the phrase: "Subject to compliance with requirements, provide products by one of the following: ..."

- 6. Non-Limited List of Manufacturers: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, which complies with requirements.
 - a. Non-limited list of manufacturers is indicated by the phrase: "Subject to compliance with requirements, available manufacturers whose products may be incorporated in the Work include, but are not limited to, the following: ..."
- 7. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
 - a. For approval of products by unnamed manufacturers, comply with requirements in Section 012500 "Substitution Procedures" for substitutions for convenience.
- C. Visual Matching Specification: Where Specifications require "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
 - 1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration of Comparable Products: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
 - 1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant product qualities include attributes such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
 - 2. Evidence that proposed product provides specified warranty.

- 3. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
- 4. Samples, if requested.
- B. Submittal Requirements: Approval by the Architect of Contractor's request for use of comparable product is not intended to satisfy other submittal requirements. Comply with specified submittal requirements.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Coordination of Owner-installed products.
 - 6. Progress cleaning.
 - 7. Starting and adjusting.
 - 8. Protection of installed construction.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for limits on use of Project site.
 - 2. Section 013300 "Submittal Procedures" for submitting surveys.
 - 3. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.
 - 4. Section 024119 "Selective Demolition" for demolition and removal of selected portions of the building.
 - 5. Section 078413 "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.4 PREINSTALLATION MEETINGS

- A. Cutting and Patching Conference: Conduct conference at Project site.
 - 1. Prior to commencing work requiring cutting and patching, review extent of cutting and patching anticipated and examine procedures for ensuring satisfactory result from cutting and patching work. Require representatives of each entity directly concerned with cutting and patching to attend, including the following:
 - a. Contractor's superintendent.
 - b. Trade supervisor responsible for cutting operations.
 - c. Trade supervisor(s) responsible for patching of each type of substrate.
 - d. Mechanical, electrical, and utilities subcontractors' supervisors, to the extent each trade is affecting by cutting and patching operations.
 - 2. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For professional engineer.
- B. Certificates: Submit certificate signed by professional engineer certifying that location and elevation of improvements comply with requirements.
- C. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:
 - 1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
 - 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
 - 3. Products: List products to be used for patching and firms or entities that will perform patching work.
 - 4. Dates: Indicate when cutting and patching will be performed.
 - 5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
 - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.
- D. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.
- E. Certified Surveys: Submit two copies signed by professional engineer.

F. Final Property Survey: Submit 10 copies showing the Work performed and record survey data.

1.6 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
- B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
 - 1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
 - 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:
 - a. Primary operational systems and equipment.
 - b. Fire separation assemblies.
 - c. Air or smoke barriers.
 - d. Fire-suppression systems.
 - e. Plumbing piping systems.
 - f. Mechanical systems piping and ducts.
 - g. Control systems.
 - h. Communication systems.
 - i. Fire-detection and -alarm systems.
 - j. Conveying systems.
 - k. Electrical wiring systems.
 - I. Operating systems of special construction.
 - 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:
 - a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Exterior curtain-wall construction.
 - d. Sprayed fire-resistive material.
 - e. Equipment supports.
 - f. Piping, ductwork, vessels, and equipment.
 - g. Noise- and vibration-control elements and systems.

- 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
 - 1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with sustainable design requirements.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services; and other utilities.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

- 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
- 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
- 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - 1. Description of the Work.
 - 2. List of detrimental conditions, including substrates.
 - 3. List of unacceptable installation tolerances.
 - 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect and Construction Manager promptly.
- B. General: Engage a professional engineer to lay out the Work using accepted surveying practices.

- 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
- 2. Establish limits on use of Project site.
- 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
- 4. Inform installers of lines and levels to which they must comply.
- 5. Check the location, level and plumb, of every major element as the Work progresses.
- 6. Notify Architect and Construction Manager when deviations from required lines and levels exceed allowable tolerances.
- 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect and Construction Manager.

3.4 FIELD ENGINEERING

- A. Identification: Owner will identify existing benchmarks, control points, and property corners.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
 - 1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
 - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

- 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
- 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework. FPA SPECIFIER/PM VERIFY OR REMOVE
- E. Final Property Survey: Engage a professional engineer to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by professional engineer, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
 - 1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
 - 2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 - 4. Maintain minimum headroom clearance of 96 inches (2440 mm) in occupied spaces and 90 inches (2300 mm) in unoccupied spaces.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Where possible, select tools or equipment that minimize production of excessive noise levels.

- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Repair or remove and replace damaged, defective, or nonconforming Work.
 - 1. Comply with Section 017700 "Closeout Procedures" for repairing or removing and replacing defective Work.

3.6 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 011000 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 - 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 6. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 - 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
- a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
- 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an evenplane surface of uniform appearance.
- 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's construction personnel.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
 - 1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
 - 2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.8 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
 - 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.

- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls." Section 017419 "Construction Waste Management and Disposal."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.9 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in Section 019113 "General Commissioning Requirements."
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

E. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.10 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.
- C. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of cleaning agent.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at final completion.

1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest control inspection.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
 - 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number.
 - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.
 - 5. Submit testing, adjusting, and balancing records.
 - 6. Submit sustainable design submittals not previously submitted.
 - 7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Advise Owner of pending insurance changeover requirements.
 - 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 - 3. Complete startup and testing of systems and equipment.
 - 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
 - 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
 - 6. Advise Owner of changeover in utility services.
 - 7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.

- 8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
- 9. Complete final cleaning requirements.
- 10. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
 - 1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 - 2. Results of completed inspection will form the basis of requirements for final completion.

1.7 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
 - 1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
 - 2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 - 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 - 4. Submit pest-control final inspection report.
 - 5. Submit final completion photographic documentation.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
 - 1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 - 1. Organize list of spaces in sequential order, starting with exterior areas first.
 - 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 - 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Page number.
 - 4. Submit list of incomplete items in the following format:
 - a. MS Excel electronic file. Architect will return annotated file.
 - b. PDF electronic file. Architect will return annotated file.
 - c. Web-based project software upload. Utilize software feature for creating and updating list of incomplete items (punch list).
 - d. Three paper copies. Architect will return two copies.

1.9 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
- D. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
 - 1. Submit: by email to Architect.
- E. Warranties in Paper Form:

- 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
- 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
- 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
- F. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
 - 1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.

- c. Rake grounds that are not planted, mulched, or paved to a smooth, even-textured surface.
- d. Remove tools, construction equipment, machinery, and surplus material from Project site.
- e. Remove snow and ice to provide safe access to building.
- f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
- g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
- h. Sweep concrete floors broom clean in unoccupied spaces.
- i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
- j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
- k. Remove labels that are not permanent.
- I. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
- n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
- o. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
 - 1) Clean HVAC system in compliance with NADCA ACR. Provide written report on completion of cleaning.
- p. Clean luminaires, lamps, globes, and reflectors to function with full efficiency.
- q. Leave Project clean and ready for occupancy.
- C. Pest Control: Comply with pest control requirements in Section 015000 "Temporary Facilities and Controls." Prepare written report.
- D. Construction Waste Disposal: Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls." Section 017419 "Construction Waste Management and Disposal."

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

- B. Repair, or remove and replace, defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
 - 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
 - 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
 - 3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
 - 4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory manuals.
 - 2. Emergency manuals.
 - 3. Systems and equipment operation manuals.
 - 4. Systems and equipment maintenance manuals.
 - 5. Product maintenance manuals.
- B. Related Requirements:
 - 1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

- A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Architect will comment on whether content of operation and maintenance submittals is acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operation and maintenance manuals in the following format:

- 1. Submit three paper copies. Architect will return two copies.
- C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.
 - 1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.
- E. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

1.5 FORMAT OF OPERATION AND MAINTENANCE MANUALS

- A. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
 - 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 - 2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- B. Manuals, Paper Copy: Submit manuals in the form of hard-copy, bound and labeled volumes.
 - 1. Binders: Heavy-duty, three-ring, vinyl-covered, post-type binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (215-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.

- 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
- 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment. Enclose title pages and directories in clear plastic sleeves.
- 4. Supplementary Text: Prepared on 8-1/2-by-11-inch (215-by-280-mm) white bond paper.
- 5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

1.6 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 - 1. Title page.
 - 2. Table of contents.
 - 3. Manual contents.
- B. Title Page: Include the following information:
 - 1. Subject matter included in manual.
 - 2. Name and address of Project.
 - 3. Name and address of Owner.
 - 4. Date of submittal.
 - 5. Name and contact information for Contractor.
 - 6. Name and contact information for Construction Manager.
 - 7. Name and contact information for Architect.
 - 8. Name and contact information for Commissioning Authority.
 - 9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 - 10. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

- 1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

1.7 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY MANUAL

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals. List items and their location to facilitate ready access to desired information. Include the following:
 - 1. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
 - 2. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
 - 3. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

1.8 EMERGENCY MANUALS

- A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- B. Content: Organize manual into a separate section for each of the following:
 - 1. Type of emergency.
 - 2. Emergency instructions.
 - 3. Emergency procedures.
- C. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 - 1. Fire.
 - 2. Flood.
 - 3. Gas leak.

- 4. Water leak.
- 5. Power failure.
- 6. Water outage.
- 7. System, subsystem, or equipment failure.
- 8. Chemical release or spill.
- D. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- E. Emergency Procedures: Include the following, as applicable:
 - 1. Instructions on stopping.
 - 2. Shutdown instructions for each type of emergency.
 - 3. Operating instructions for conditions outside normal operating limits.
 - 4. Required sequences for electric or electronic systems.
 - 5. Special operating instructions and procedures.

1.9 SYSTEMS AND EQUIPMENT OPERATION MANUALS

- A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 - 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 - 2. Performance and design criteria if Contractor has delegated design responsibility.
 - 3. Operating standards.
 - 4. Operating procedures.
 - 5. Operating logs.
 - 6. Wiring diagrams.
 - 7. Control diagrams.
 - 8. Piped system diagrams.
 - 9. Precautions against improper use.
 - 10. License requirements including inspection and renewal dates.
- C. Descriptions: Include the following:

- 1. Product name and model number. Use designations for products indicated on Contract Documents.
- 2. Manufacturer's name.
- 3. Equipment identification with serial number of each component.
- 4. Equipment function.
- 5. Operating characteristics.
- 6. Limiting conditions.
- 7. Performance curves.
- 8. Engineering data and tests.
- 9. Complete nomenclature and number of replacement parts.
- D. Operating Procedures: Include the following, as applicable:
 - 1. Startup procedures.
 - 2. Equipment or system break-in procedures.
 - 3. Routine and normal operating instructions.
 - 4. Regulation and control procedures.
 - 5. Instructions on stopping.
 - 6. Normal shutdown instructions.
 - 7. Seasonal and weekend operating instructions.
 - 8. Required sequences for electric or electronic systems.
 - 9. Special operating instructions and procedures.
- E. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- F. Piped Systems: Diagram piping as installed, and identify color coding where required for identification.

1.10 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds as described below.

- C. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- D. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:
 - 1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
 - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 - 3. Identification and nomenclature of parts and components.
 - 4. List of items recommended to be stocked as spare parts.
- E. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
 - 1. Test and inspection instructions.
 - 2. Troubleshooting guide.
 - 3. Precautions against improper maintenance.
 - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - 5. Aligning, adjusting, and checking instructions.
 - 6. Demonstration and training video recording, if available.
- F. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
 - 1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 - 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- G. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

- H. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- I. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.
- J. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original project record documents as part of maintenance manuals.

1.11 PRODUCT MAINTENANCE MANUALS

- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- B. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- C. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- D. Product Information: Include the following, as applicable:
 - 1. Product name and model number.
 - 2. Manufacturer's name.
 - 3. Color, pattern, and texture.
 - 4. Material and chemical composition.
 - 5. Reordering information for specially manufactured products.
- E. Maintenance Procedures: Include manufacturer's written recommendations and the following:
 - 1. Inspection procedures.
 - 2. Types of cleaning agents to be used and methods of cleaning.
 - 3. List of cleaning agents and methods of cleaning detrimental to product.
 - 4. Schedule for routine cleaning and maintenance.
 - 5. Repair instructions.
- F. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

- G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Section 017700 "Closeout Procedures" for general closeout procedures.
 - 2. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one set(s) of marked-up record prints.
 - 2. Number of Copies: Submit copies of record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit one paper-copy set(s) of marked-up record prints.
 - 2) Submit PDF electronic files of scanned record prints and one of file prints.
 - 3) Submit record digital data files and one set(s) of plots.
 - 4) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal:
 - 1) Submit three paper-copy set(s) of marked-up record prints.
 - 2) Submit PDF electronic files of scanned record prints and three set(s) of prints.

- 3) Print each drawing, whether or not changes and additional information were recorded.
- c. Final Submittal:
 - 1) Submit one paper-copy set(s) of marked-up record prints.
 - 2) Submit record digital data files and three set(s) of record digital data file plots.
 - 3) Plot each drawing file, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.
 - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.
- E. Reports: Submit written report weekly indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

1.4 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
 - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding photographic documentation.
 - 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.

- b. Revisions to details shown on Drawings.
- c. Depths of foundations.
- d. Locations and depths of underground utilities.
- e. Revisions to routing of piping and conduits.
- f. Revisions to electrical circuitry.
- g. Actual equipment locations.
- h. Duct size and routing.
- i. Locations of concealed internal utilities.
- j. Changes made by Change Order or Construction Change Directive.
- k. Changes made following Architect's written orders.
- I. Details not on the original Contract Drawings.
- m. Field records for variable and concealed conditions.
- n. Record information on the Work that is shown only schematically.
- 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
- 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
- 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
- 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
 - 1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
 - 2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 - 3. Refer instances of uncertainty to Architect for resolution.
 - 4. Architect will furnish Contractor with one set of digital data files of the Contract Drawings for use in recording information.
 - a. See Section 013100 "Project Management and Coordination" for requirements related to use of Architect's digital data files.
 - b. Architect will provide data file layer information. Record markups in separate layers.
- C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
 - 1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 - 2. Format: Annotated PDF electronic file.

- 3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
- 4. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect.
 - e. Name of Contractor.

1.5 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 - 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 - 4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 - 5. Note related Change Orders and record Drawings where applicable.

1.6 RECORD PRODUCT DATA

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 - 3. Note related Change Orders and record Drawings where applicable.

1.7 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the

Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

1.8 MAINTENANCE OF RECORD DOCUMENTS

A. Maintenance of Record Documents: Store record documents in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

PART 2 - PRODUCTS

PART 3 - EXECUTION

END OF SECTION 017839

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of selected portions of building or structure.
 - 2. Salvage of existing items to be reused or recycled.

1.2 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.3 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at Project site.

1.4 INFORMATIONAL SUBMITTALS

- A. Engineering Survey: Submit engineering survey of condition of building.
- B. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for dust control and for noise control. Indicate proposed locations and construction of barriers.
- C. Schedule of selective demolition activities with starting and ending dates for each activity.
- D. Predemolition photographs or video.
- E. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician.

1.5 CLOSEOUT SUBMITTALS

A. Inventory of items that have been removed and salvaged.

1.6 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.7 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
 - 1. Before selective demolition, Owner will remove all salvageable items.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
- G. Maintain fire-protection facilities in service during selective demolition operations.
- H. Arrange selective demolition schedule so as not to interfere with Owner's operations.
- I. Demolition of structural cmu wall.
- J. General stud wall demolition & existing door removal, removal of floor finishes & ceiling tile, low walls, mirrors turn over to owner.
- K. Protection and dust/debri screens for construction site, define staging area, delivery times, etc.

1.8 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Engage a professional engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
- C. Inventory and record the condition of items to be removed and salvaged.

3.2 PREPARATION

A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.

- 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
- 2. Arrange to shut off utilities with utility companies.
- 3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
- 4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
 - f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
 - g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

3.4 **PROTECTION**

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
- C. Remove temporary barricades and protections where hazards no longer exist.

3.5 SELECTIVE DEMOLITION

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.

- 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
- 3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
- 4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
- 5. Dispose of demolished items and materials promptly. Comply with requirements in Section 017419 "Construction Waste Management and Disposal."
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Removed and Salvaged Items:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to Owner's storage area designated by Owner.
 - 5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
 - 1. Clean and repair items to functional condition adequate for intended reuse.
 - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 - 3. Protect items from damage during transport and storage.
 - 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.6 CLEANING

- A. Remove demolition waste materials from Project site and dispose of them in an EPAapproved construction and demolition waste landfill acceptable to authorities having jurisdiction.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

- 4. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.
- C. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

1.2 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, and other pozzolans materials subject to compliance with requirements.
- B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.3 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Cementitious materials.
 - 2. Admixtures.
 - 3. Curing compounds.
 - 4. Vapor retarders.
 - 5. Joint-filler strips.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Comply with ASTM C94/C94M and ACI 301 (ACI 301M).

1.5 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 301 (ACI 301M) and ACI 306.1.
- B. Hot-Weather Placement: Comply with ACI 301 (ACI 301M) and ACI 305.1 (ACI 305.1M).

PART 2 - PRODUCTS

- 2.1 CONCRETE, GENERAL
 - A. ACI Publications: Comply with ACI 301 (ACI 301M) unless modified by requirements in the Contract Documents.

2.2 CONCRETE MATERIALS

- A. Cementitious Materials:
 - 1. Portland Cement: ASTM C150/C150M, Type I, gray.
- B. Lightweight Aggregate: ASTM C330/C330M, 3/8-inch (10-mm) nominal maximum aggregate size.
- C. Air-Entraining Admixture: ASTM C260/C260M.
- D. Water : ASTM C94/C94M, potable or complying with ASTM C1602/C1602M, including all limits listed in Table 2 and the requirements of paragraph 5.4

2.3 VAPOR RETARDERS

- A. Sheet Vapor Retarder, Class A: ASTM E1745, Class A; not less than 6 mils thick. Include manufacturer's recommended adhesive or pressure-sensitive tape.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. <u>Stego Industries, LLC</u>.
 - b. <u>W.R. Meadows, Inc</u>.

2.4 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.
- B. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.
 - 1. Color:
 - a. Ambient Temperature Below 50 deg F (10 deg C): Black.
 - b. Ambient Temperature between 50 deg F (10 deg C) and 85 deg F (29 deg C): Any color.
 - c. Ambient Temperature Above 85 deg F (29 deg C): White.

- C. Curing Paper: Eight-feet- (2438-mm-) wide paper, consisting of two layers of fibered kraft paper laminated with double coating of asphalt.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Fortifiber Building Systems Group.
- D. Water: Potable or complying with ASTM C1602/C1602M.
- E. Clear, Waterborne, Membrane-Forming, Dissipating Curing Compound: ASTM C309, Type 1, Class B.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Euclid Chemical Company (The); an RPM company.
 - b. Kaufman Products, Inc.
 - c. <u>Nox-Crete Products Group</u>.
 - d. <u>SpecChem, LLC</u>.
 - e. <u>W.R. Meadows, Inc</u>.

2.5 RELATED MATERIALS

- A. Floor Slab Protective Covering: Eight-feet- (2438-mm-) wide cellulose fabric.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. <u>McTech Group, Inc</u>.
- 2.6 CONCRETE MIXTURES, GENERAL
 - A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301 (ACI 301M).
 - 1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.
 - B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
 - 1. Fly Ash or Other Pozzolans: 25 percent by mass.
 - 2. Slag Cement: 50 percent by mass.
 - 3. Total of Fly Ash or Other Pozzolans, Slag Cement: 50 percent by mass, with fly ash or pozzolans not exceeding 25 percent by mass.

4. Total of Fly Ash or Other Pozzolans: 35 percent by mass with fly ash or pozzolans not exceeding 25 percent by mass.

2.7 CONCRETE MIXTURES

- A. Class C: Normal-weight concrete used for interior slabs-on-ground.
 - 1. Exposure Class: ACI 318 (ACI 318M) F0.
 - 2. Minimum Compressive Strength: 3000 psi (20.7 MPa) at 28 days.
 - 3. Maximum w/cm: 0.50.
 - 4. Minimum Cementitious Materials Content: 470 lb/cu. yd. (279 kg/cu. m).
 - 5. Slump Limit: 4 inches (100 mm), plus or minus 1 inch (25 mm).
 - 6. Slump Flow Limit: 30 inches (762 mm), plus or minus 2.5 inches (65 mm).
 - 7. Air Content:
 - a. Do not use an air-entraining admixture or allow total air content to exceed 3 percent for concrete used in trowel-finished floors.
 - 8. Limit water-soluble, chloride-ion content in hardened concrete to 1.00 percent by weight of cement.

2.8 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M and ASTM C1116/C1116M, and furnish batch ticket information.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete in accordance with ASTM C94/C94M. Mix concrete materials in appropriate drum-type batch machine mixer.
 - 1. For mixer capacity of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than five minutes after ingredients are in mixer, before any part of batch is released.
 - 2. For mixer capacity larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).
 - 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 INSTALLATION OF VAPOR RETARDER

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder in accordance with ASTM E1643 and manufacturer's written instructions.

- 1. Install vapor retarder with longest dimension parallel with direction of concrete pour.
- 2. Face laps away from exposed direction of concrete pour.
- 3. Lap vapor retarder over footings and grade beams not less than 6 inches (150 mm), sealing vapor retarder to concrete.
- 4. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.
- 5. Terminate vapor retarder at the top of floor slabs, grade beams, and pile caps, sealing entire perimeter to floor slabs, grade beams, foundation walls, or pile caps.
- 6. Seal penetrations in accordance with vapor retarder manufacturer's instructions.
- 7. Protect vapor retarder during placement of reinforcement and concrete.
 - a. Repair damaged areas by patching with vapor retarder material, overlapping damages area by 6 inches (150 mm) on all sides, and sealing to vapor retarder.

3.2 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.
 - 1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
 - 2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.
- B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.
- C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect in writing, but not to exceed the amount indicated on the concrete delivery ticket.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301 (ACI 301M), but not to exceed the amount indicated on the concrete delivery ticket.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- E. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.
 - 1. If a section cannot be placed continuously, provide construction joints as indicated.
 - 2. Deposit concrete to avoid segregation.

- 3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
- 4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301 (ACI 301M).
 - a. Do not use vibrators to transport concrete inside forms.
 - b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer.
 - c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
 - d. At each insertion, limit duration of vibration to time necessary to consolidate concrete, and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- F. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
 - 1. Do not place concrete floors and slabs in a checkerboard sequence.
 - 2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 3. Maintain reinforcement in position on chairs during concrete placement.
 - 4. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 5. Level concrete, cut high areas, and fill low areas.
 - 6. Slope surfaces uniformly to drains where required.
 - 7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
 - 8. Do not further disturb slab surfaces before starting finishing operations.

3.3 FINISHING FORMED SURFACES

- A. Trowel Finish:
 - 1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
 - 2. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance.
 - 3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
 - 4. Do not add water to concrete surface.
 - 5. Do not apply hard-troweled finish to concrete, which has a total air content greater than 3 percent.
 - 6. Apply a trowel finish to surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
 - 7. Finish and measure surface, so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.- (3.05-m-) long straightedge resting on two high spots
and placed anywhere on the surface does not exceed 1/16 inch (1.6 mm) in 2 feet (610 mm).

3.4 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

- A. Filling In:
 - 1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
 - 2. Mix, place, and cure concrete, as specified, to blend with in-place construction.
 - 3. Provide other miscellaneous concrete filling indicated or required to complete the Work.

END OF SECTION 033000

SECTION 035416 - HYDRAULIC CEMENT UNDERLAYMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Polymer-modified, self-leveling, hydraulic cement underlayment for application below interior floor coverings.
- 1.2 PREINSTALLATION MEETINGS
 - A. Preinstallation Conference: Conduct conference at Project site.
- 1.3 ACTION SUBMITTALS
 - A. Product Data: For the following:
 - 1. Hydraulic cement underlayment.

1.4 FIELD CONDITIONS

- A. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ventilation, ambient temperature and humidity, and other conditions affecting underlayment performance.
 - 1. Place hydraulic cement underlayments only when ambient temperature and temperature of substrates are between 50 and 80 deg F (10 and 27 deg C).

PART 2 - PRODUCTS

2.1 HYDRAULIC CEMENT UNDERLAYMENTS

- A. Hydraulic Cement Underlayment: Polymer-modified, self-leveling, hydraulic cement product that can be applied in minimum uniform thickness of 1/4 inch (6 mm) and that can be feathered at edges to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C150/C150M, portland cement, or hydraulic or blended hydraulic cement as defined by ASTM C219.
 - 2. Compressive Strength: Not less than 4000 psi (27.6 MPa) at 28 days when tested according to ASTM C109/C109M.

- 3. Underlayment Additive: Resilient-emulsion product of underlayment manufacturer, formulated for use with underlayment when applied to substrate and conditions indicated.
- B. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3 to 6 mm); or coarse sand as recommended by underlayment manufacturer.
 - 1. Provide aggregate when recommended in writing by underlayment manufacturer for underlayment thickness required.
- C. Water: Potable and at a temperature of not more than 70 deg F (21 deg C).
- D. Primer: Product of underlayment manufacturer recommended in writing for substrate, conditions, and application indicated.
- E. Surface Sealer: Designed to reduce porosity as recommended by manufacturer for type of floor covering to be applied to underlayment.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare and clean substrate according to manufacturer's written instructions.
 - 1. Treat nonmoving substrate cracks according to manufacturer's written instructions to prevent cracks from telegraphing (reflecting) through underlayment.
 - 2. Fill substrate voids to prevent underlayment from leaking.
- B. Concrete Substrates: Mechanically remove, according to manufacturer's written instructions, laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants that might impair underlayment bond.
 - 1. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft. (18.6 sq. m), and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
 - a. Anhydrous Calcium Chloride Test, ASTM F1869. Proceed with installation only after substrates do not exceed a maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/100 sq. m) in 24 hours.
 - b. Relative Humidity Test: Using in situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 85 percent relative humidity level measurement, or as recommended by hydraulic cement underlayment manufacturer.
- C. Nonporous Substrates: For ceramic tile, quarry tile, and terrazzo substrates, remove waxes, sealants, and other contaminants that might impair underlayment bond, and prepare surfaces according to manufacturer's written instructions.

D. Adhesion Tests: After substrate preparation, test substrate for adhesion with underlayment according to manufacturer's written instructions.

3.2 INSTALLATION

- A. Mix and install underlayment components according to manufacturer's written instructions.
 - 1. Close areas to traffic during underlayment installation and for time period after installation recommended in writing by manufacturer.
 - 2. Coordinate installation of components to provide optimum adhesion to substrate and between coats.
 - 3. At substrate expansion, isolation, and other moving joints, allow joint of same width to continue through underlayment.
- B. Apply primer over prepared substrate at manufacturer's recommended spreading rate.
- C. Install underlayment to produce uniform, level surface.
 - 1. Install a final layer without aggregate to product surface.
 - 2. Feather edges to match adjacent floor elevations.
- D. Cure underlayment according to manufacturer's written instructions. Prevent contamination during installation and curing processes.
- E. Do not install floor coverings over underlayment until after time period recommended in writing by underlayment manufacturer.
- F. Apply surface sealer at rate recommended by manufacturer.
- G. Remove and replace underlayment areas that evidence lack of bond with substrate, including areas that emit a "hollow" sound when tapped.

3.3 INSTALLATION TOLERANCES

A. Finish and measure surface, so gap at any point between gypsum cement underlayment surface and an unleveled, freestanding, 10-foot- (3.05-m-) long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/16 inch (1.6 mm) in 2 feet (610 mm).

END OF SECTION 035416

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Framing with dimension lumber.
 - 2. Framing with engineered wood products.
 - 3. Wood furring, grounds, nailers, and blocking.
 - 4. Sheathing.
 - 5. Subflooring.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 6 Section "Metal-Plate-Connected Wood Trusses."
 - 2. Division 6 Section "Finish Carpentry" for nonstructural carpentry items exposed to view and not specified in another Section.

1.3 DEFINITIONS

A. Rough Carpentry: Carpentry work not specified in other Sections and not exposed, unless otherwise specified.

1.4 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for the following products:
 - 1. Engineered wood products.
 - 2. Metal framing anchors.
 - 3. Construction adhesives.
- C. Material certificates for dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the American Lumber Standards Committee's (ALSC) Board of Review.
- D. Wood treatment data as follows, including chemical treatment manufacturer's instructions for handling, storing, installing, and finishing treated materials:

ROUGH CARPENTRY

- 1. For each type of preservative-treated wood product, include certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained, and compliance with applicable standards.
- 2. For waterborne-treated products, include statement that moisture content of treated materials was reduced to levels indicated before shipment to Project site.
- 3. For fire-retardant-treated wood products, include certification by treating plant that treated materials comply with specified standard and other requirements as well as data relative to bending strength, stiffness, and fastener-holding capacities of treated materials.
- E. Material test reports from a qualified independent testing agency indicating and interpreting test results relative to compliance of fire-retardant-treated wood products with requirements indicated. F. Warranty of chemical treatment manufacturer for each type of treatment.
- F. Research or evaluation reports of the model code organization acceptable to authorities having jurisdiction that evidence the following products' compliance with building code in effect for Project.
 - 1. Engineered wood products.
 - 2. Metal framing anchors.
 - 3. Power-driven fasteners.
 - 4. Fire-retardant-treated wood.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: To qualify for approval, an independent testing agency must demonstrate to Architect's satisfaction, based on evaluation of agency-submitted criteria conforming to ASTM E 699, that it has the experience and capability to satisfactorily conduct the testing indicated without delaying the Work.
- B. Single-Source Responsibility for Engineered Wood Products: Obtain each type of engineered wood product from one source and by a single manufacturer.
- C. Single-Source Responsibility for Fire-Retardant-Treated Wood: Obtain each type of fire-retardant-treated wood product from one source and by a single producer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Keep materials under cover and dry. Protect from weather and contact with damp or wet surfaces. Stack lumber, plywood, and other panels. Provide for air circulation within and around stacks and under temporary coverings.
 - 1. For lumber and plywood pressure treated with waterborne chemicals, place spacers between each bundle to provide air circulation.

PART 2 - PRODUCTS

ROUGH CARPENTRY

2.1 MANUFACTURERS

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

Wood-Preservative-Treated Materials:

- a. Baxter: J. H. Baxter Co.
- b. Chemical Specialties, Inc.
- c. Continental Wood Preservers, Inc.
- d. Hickson Corp.
- e. Hoover Treated Wood Products, Inc.
- f. Osmose Wood Preserving, Inc.
- 2. Fire-Retardant-Treated Materials, Exterior Type:
 - a. American Wood Treaters, Inc.
 - b. Hoover Treated Wood Products, Inc.
- 4. Metal Framing Anchors:
 - a. Cleveland Steel Specialty Co.
 - b. Harlen Metal Products, Inc.
 - c. Silver Metal Products, Inc.
 - d. Simpson Strong-Tie Company, Inc.
 - e. Southeastern Metals Manufacturing Co., Inc.

2.2 LUMBER, GENERAL

- A. Lumber Standards: Comply with DOC PS 20, "American Softwood Lumber Standard," and with applicable grading rules of inspection agencies certified by ALSC's Board of Review.
- B. Inspection Agencies: Inspection agencies, and the abbreviations used to reference them, include the following:
 - 1. NELMA Northeastern Lumber Manufacturers Association.
 - 2. NLGA National Lumber Grades Authority (Canadian).
 - 3. SPIB Southern Pine Inspection Bureau.
 - 4. WCLIB West Coast Lumber Inspection Bureau.
 - 5. WWPA Western Wood Products Association.
- C. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.
 - 1. For exposed lumber, furnish pieces with grade stamps applied to ends or back of each piece, or omit grade stamps and provide grade-compliance certificates issued by inspection agency.

D. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.

Provide dressed lumber, S4S, unless otherwise indicated.

2. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal (38-mm actual) thickness or less, unless otherwise indicated.

2.3 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. General: Where lumber or plywood is indicated as preservative treated or is specified to be treated, comply with applicable requirements of AWPA C2 (lumber) and AWPA C9 (plywood). Mark each treated item with the Quality Mark Requirements of an inspection agency approved by ALSC's Board of Review.
 - 1. Do not use chemicals containing chromium or arsenic.
 - 2. For exposed items indicated to receive stained finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.
- B. Pressure treat aboveground items with waterborne preservatives to a minimum retention of 0.25 lb/cu.
 ft. (4.0 kg/cu. m). After treatment, kiln-dry lumber and plywood to a maximum moisture content of 19 and 15 percent, respectively. Treat indicated items and the following:
 - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 - 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
 - 3. Wood framing members less than 18 inches (460 mm) above grade.
 - 4. Wood floor plates installed over concrete slabs directly in contact with earth.
- C. Complete fabrication of treated items before treatment, where possible. If cut after treatment, apply field treatment complying with AWPA M4 to cut surfaces. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.

2.4 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated wood is indicated, comply with applicable requirements of AWPA C20 (lumber) and AWPA C27 (plywood). Identify fire-retardant-treated wood with appropriate classification marking of UL; U.S. Testing; Timber Products Inspection, Inc.; or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Research or Evaluation Reports: Provide fire-retardant-treated wood acceptable to authorities having jurisdiction and for which a current model code research or evaluation report exists that evidences compliance of fire-retardant-treated wood for application indicated.

2. For exposed items indicated to receive stained finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes. B. Exterior Type: Use for exterior locations and where indicated.

C. Inspect each piece of treated lumber or plywood after drying and discard damaged or defective pieces.

2.5 DIMENSION LUMBER

- A. General: Provide dimension lumber of grades indicated according to the ALSC National Grading Rule (NGR) provisions of the inspection agency indicated.
- B. Non-Load-Bearing Interior Partitions: Provide framing of the following grade and species: Species: Southern pine; SPIB.
- C. Exterior and Load-Bearing Walls: Provide framing of the following grade and species:
 - 1. Grade: No. 2.
 - 2. Species: Southern pine; SPIB.
 - 3. Species: Mixed southern pine; SPIB.
- D. Other Framing Not Listed Above: Provide the following grades and species:
 - 1. Species: Southern pine; SPIB.

2.6 MISCELLANEOUS LUMBER

A. General: Provide lumber for support or attachment of other construction, including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping, and similar members.

B. Fabricate miscellaneous lumber from dimension lumber of sizes indicated and into shapes shown.

C. Moisture Content: 19 percent maximum for lumber items not specified to receive wood preservative treatment.

Grade: For dimension lumber sizes, provide No. 3 or Standard grade lumber per ALSC's NGRs of any species. For board-size lumber, provide No. 3 Common grade per NELMA, NLGA, or WWPA; No. 2 grade per SPIB; or Standard grade per NLGA, WCLIB or WWPA of any species.

2.8 ENGINEERED WOOD PRODUCTS

- A. General: Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that evidence compliance with building code in effect for Project.
 - 1. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published

values shall be determined from empirical data or by rational engineering analysis, and demonstrated by comprehensive testing performed by a qualified independent testing agency.

- B. Laminated-Veneer Lumber: Lumber manufactured by laminating wood veneers in a continuous press using an exterior-type adhesive complying with ASTM D 2559 to produce members with grain of veneers parallel to their lengths and complying with the following requirements:
 - 1. Extreme Fiber Stress in Bending: 2600 psi for 12-inch nominal- (286-mm actual-) depth members.
 - 2. Modulus of Elasticity: 1,900,000 psi.
 - 3. Tension Parallel to Grain: 1555 psi.
 - 4. Compression Parallel to Grain: 2510 psi.
 - 5. Compression Perpendicular to Grain: 750 psi.
 - 6. Horizontal Shear: 285 psi perpendicular to and 190 psi (1.3 MPa) parallel to glue line.

2.9 WOOD-BASED STRUCTURAL-USE PANELS, GENERAL

- A. Structural-Use Panel Standards: Provide either all-veneer, mat-formed, or composite panels complying with DOC PS 2, "Performance Standard for Wood-Based Structural-Use Panels," unless otherwise indicated. Provide plywood panels complying with DOC PS 1, "U.S. Product Standard for Construction and Industrial Plywood," where plywood is indicated.
- B. Structural-Use Panel Standard: Provide plywood panels complying with DOC PS 1, "U.S. Product Standard for Construction and Industrial Plywood."
- C. Trademark: Factory mark structural-use panels with APA trademark evidencing compliance with grade requirements.
- D. Subflooring: APA-rated sheathing.
 - 1. Exposure Durability Classification: Exposure 1.
 - 2. Span Rating: 48/24 or Subfloor 24.
- E. Wall Sheathing: APA-rated Structural II sheathing.
 - 1. Exposure Durability Classification: Exposure 1.
 - 2. Span Rating: 32/16 for stud spacing of 16 inches (610

mm) or less.

Roof Sheathing: APA-rated Structural I or II sheathing.

- 1. Exposure Durability Classification: Interior with exterior glue.
- 2. Span Rating: 48/24 or Roof 48.
- 3. Fire retardant treated where indicated..

2.10 FASTENERS

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

ROUGH CARPENTRY

1. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with a hot-dip zinc coating per ASTM A 153 or of Type 304 stainless steel. B. Nails, Wire, Brads, and Staples: FS FF-N-105.

- C. Power-Driven Fasteners: CABO NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Lag Bolts: ASME B18.2.1. (ASME B18.2.3.8M)
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

2.11 METAL FRAMING ANCHORS

- A. General: Provide galvanized steel framing anchors of structural capacity, type, and size indicated and as follows:
 - 1. Research or Evaluation Reports: Provide products for which model code research or evaluation reports exist that are acceptable to authorities having jurisdiction and that evidence compliance of metal framing anchors for application indicated with building code in effect for Project.
 - 2. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis, and demonstrated by comprehensive testing performed by a qualified independent testing agency.
- B. Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653, G60 (ASTM A 653M, Z180) coating designation; structural, commercial, or lock-forming quality, as standard with manufacturer for type of anchor indicated.
- C. Joist Hangers: U-shaped joist hangers with 2-inch- (50-mm-) long seat and 1-1/4-inch- (32-mm-) wide nailing flanges at least 85 percent of joist depth.
 1. Thickness: 0.064 inch (1.6 mm).
- D. Post Bases: Adjustable-socket type for bolting in place with standoff plate to raise post 1 inch (25 mm) above base and with 2-inch (50-mm) minimum side cover, socket 0.064 inch (1.6 mm) thick, standoff and adjustment plates 0.108 inch (2.8 mm) thick.
- E. Rafter Tie-Downs (Hurricane Ties): Bent strap tie for fastening rafters or roof trusses to wall studs below, 1-5/8 inches (41 mm) wide by 0.052 inch (1.3 mm) thick.
- F. Floor-to-Floor Ties: Flat straps, with holes for fasteners, for tying upper floor wall studs to band joists and lower floor studs, 1-1/4 inches (32 mm) wide by 0.052 inch (1.3 mm) thick by 36 inches (900 mm) long.
- G. Hold-Downs: Brackets for bolting to wall studs and securing to foundation walls with anchor bolts or to other hold-downs with threaded rods and designed with first of 2 bolts placed 7 bolt diameters from reinforced base.

1. See manufacturer requirements for type of holddown indicated.

2.12 MISCELLANEOUS MATERIALS

- A. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1inch (25mm) nominal thickness, compressible to 1/32 inch (0.8 mm); selected from manufacturer's standard widths to suit width of sill members indicated.
- B. Adhesives for Field Gluing Panels to Framing: Formulation complying with APA AFG-01 that is approved for use with type of construction panel indicated by both adhesive and panel manufacturers.
- C. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbonate (IPBC) as its active ingredient.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Discard units of material with defects that impair quality of rough carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.
- B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted.
- C. Fit rough carpentry to other construction; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction.
- D. Apply field treatment complying with AWPA M4 to cut surfaces of preservative-treated lumber and plywood.
- E. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. CABO NER-272 for power-driven staples, P-nails, and allied fasteners.
 - 2. Published requirements of metal framing anchor manufacturer.
 - 3. "Recommended Nailing Schedule" of referenced framing standard and with AFPA's "National Design Specifications for Wood Construction."
 - 4. "Table 23-I-Q--Nailing Schedule" of the International Building Code.
- F. Use common wire nails, unless otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; predrill as required.
- G. Use hot-dip galvanized or stainless-steel nails where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity.

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H. Countersink nail heads on exposed carpentry work and fill holes with wood filler.

3.2 WOOD GROUNDS, NAILERS, BLOCKING, AND SLEEPERS

- A. Install wood grounds, nailers, blocking, and sleepers where shown and where required for screeding or attaching other work. Form to shapes shown and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.
- C. Install permanent grounds of dressed, preservative-treated, key-beveled lumber not less than 1-1/2 inches (38 mm) wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 WOOD FRAMING, GENERAL

- A. Framing Standard: Comply with AFPA's "Manual for Wood Frame Construction," unless otherwise indicated.
- B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- C. Install framing members of size and at spacing indicated.
- D. Do not splice structural members between supports.
- E. Firestop concealed spaces of wood-framed walls and partitions at each floor level and at ceiling line of top story. Where firestopping is not inherent in framing system used, provide closely fitted wood blocks of 2-inch nominal- (38-mm actual-) thickness lumber of same width as framing members.

3.4 WALL AND PARTITION FRAMING

- A. General: Arrange studs so that wide face of stud is perpendicular to direction of wall or partition and narrow face is parallel. Provide single bottom plate and double top plates using members of 2-inch nominal (38-mm actual) thickness whose widths equal that of studs; except single top plate may be used for non-load-bearing partitions. Nail or anchor plates to supporting construction, unless otherwise indicated.
 - 1. For exterior walls, provide 2-by-4-inch nominal- (38-by-89-mm actual-) size wood studs spaced 16 inches (406 mm) o.c., except where otherwise indicated or required.
 - 2. For exterior walls, provide 38-by-140-mm actual-size wood studs spaced 600 mm o.c., except where otherwise indicated or required.
 - 3. For exterior walls, provide 38-by-89-mm actual-size wood studs spaced 400 mm o.c., except where otherwise indicated or required.
 - 4. For interior partitions and walls, provide 2-by-4-inch nominal- (38-by-89-mm actual-) size wood studs spaced 16 inches (406 mm) o.c., except where otherwise indicated or required.

- 5. For interior partitions and walls, provide 38-by-89-mm actual-size wood studs spaced 400 mm o.c., except where otherwise indicated or required.
- B. Construct corners and intersections with 3 or more studs. Provide miscellaneous blocking and framing as shown and as required to support facing materials, fixtures, specialty items, and trim.
 - 1. Provide continuous horizontal blocking at midheight of single-story partitions over 96 inches (2438 mm) high and multistory partitions, using members of 2-inch nominal (38-mm actual) thickness and of same width as wall or partitions.
- C. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Set headers on edge and support on jamb studs.
 - 1. For non-load-bearing partitions, provide double-jamb studs with headers not less than 4-inch nominal (89-mm actual) depth for openings 36 inches (900 mm) and less in width, and not less than 6-inch nominal (140-mm actual) depth for wider openings.
 - 2. For load-bearing walls, provide double-jamb studs for openings 72 inches (1800 mm) and less in width, and triple-jamb studs for wider openings. Provide headers of depth shown or, if not shown, as recommended by AFPA's "Manual for Wood Frame Construction."
- D. Provide bracing in exterior walls, at both walls of each external corner, full-story height, unless otherwise indicated. Provide one of the following:
- E. Provide bracing in walls, at locations indicated, full-story height, unless otherwise indicated. Provide one of the following:
 - 1. Diagonal bracing at 45-degree angle using let-in 1-by-4-inch nominal- (19-by-89-mm actual-) size boards.
 - 2. Diagonal bracing at 45-degree angle using metal bracing.
 - 3. Plywood panels, not less than 48 by 96 inches (1219 by 2438 mm) applied vertically.
 - 4. Performance-rated structural-use panels, not less than 48 by 96 inches (1219 by 2438 mm) applied vertically.

3.5 FLOOR JOIST FRAMING

A. General: Install floor joists with crown edge up and support ends of each member with not less than 1-1/2 inches (38 mm) of bearing on wood or metal, or 3 inches (76 mm) on masonry. Attach floor joists as follows:

1. Where supported on wood members, by toe nailing or by using metal framing anchors.

- B. Do not notch in middle third of joists; limit notches to 1/6 depth of joist, 1/3 at ends. Do not bore holes larger than 1/3 depth of joist; do not locate closer than 2 inches (50 mm) from top or bottom.
- C. Provide solid blocking of 2-inch nominal (38-mm actual) thickness by depth of joist at ends of joists unless nailed to header or band.

- D. Lap members framing from opposite sides of beams, girders, or partitions not less than 4 inches (102 mm) or securely tie opposing members together. Provide solid blocking of 2-inch nominal (38-mm actual) thickness by depth of joist over supports.
- E. Provide bridging of type indicated below, at intervals of 72 inches (2438 mm) o.c., between joists.

3.6 INSTALLATION OF STRUCTURAL-USE PANELS

- A. General: Comply with applicable recommendations contained in APA Form No. E30, "APA Design/Construction Guide: Residential & Commercial," for types of structural-use panels and applications indicated.
 - 1. Comply with "Code Plus" provisions of above referenced guide.

Fastening Methods: Fasten panels as indicated below:

Subflooring: Glue and nail to framing throughout.

- a. Space panels 1/8 inch (3 mm) at edges and ends.
- b. Sheathing: Nail to framing.
- c. Space panels 1/8 inch (3 mm) at edges and ends.

END OF SECTION 061000

SECTION 062023 - INTERIOR FINISH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Interior standing and running trim.
 - 2. Wood furring, blocking, shims, and hanging strips for installing woodwork items unless concealed within other construction before woodwork installation.
- B. Related Requirements:
 - 1. Division 06 "Miscellaneous Rough Carpentry" for furring, blocking, and other carpentry work not exposed to view.
 - 2. Division 09 "Painting" for priming and back priming of interior finish carpentry.

1.3 DEFINITIONS

- A. MDF: Medium-density fiberboard.
- B. MDO: Plywood with a medium-density overlay on the face.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials, dimensions, profiles, textures, and colors and include construction and application details.
 - 1. Include data for wood-preservative treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained. Include chemical-treatment manufacturer's written instructions for finishing treated material.
 - 2. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.
 - 3. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced before shipment to Project site to levels specified.

- B. Samples for Initial Selection: For each type of product involving selection of colors, profiles, or textures.
- C. Samples for Verification:
 - 1. For each species and cut of lumber with non-factory-applied finish, with half of exposed surface finished, 50 sq. in. for lumber and 8 by 10 inches for panels.
 - 2. For each finish system and color of lumber and panel products with factory-applied finish, 50 sq. in. for lumber and 8 by 10 inches for panels.

1.5 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For fire-retardant-treated wood, from ICC-ES.
- B. Sample Warranty: For manufacturer's warranty.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber, plywood, and other panels flat with spacers between each bundle to provide air circulation. Protect materials from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.
- B. Deliver interior finish carpentry materials only when environmental conditions comply with requirements specified for installation areas. If interior finish carpentry materials must be stored in other than installation areas, store only where environmental conditions comply with requirements specified for installation areas.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install interior finish carpentry materials until building is enclosed and weatherproof, wet work in space is completed and nominally dry, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.
 - 1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.
- C. Field Measurements: Take field measurements prior to fabrication of the work and preparation of shop drawings, to ensure proper fitting of the work. Show recorded measurements on final shop drawings. Notify the Owner and Architect, in writing, of any dimensions found which are not within specified dimensions and tolerances in the Contract Documents, prior to proceeding with the fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the work.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the American Lumber Standard Committee's Board of Review. Grade lumber by an agency certified by the American Lumber Standard Committee's Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. For exposed lumber, mark grade stamp on end or back of each piece, or omit grade stamp and provide certificates of grade compliance issued by grading agency.
- B. Softwood Plywood: DOC PS 1.
- C. Hardboard: ANSI A135.4.
- D. MDF: ANSI A208.2, Grade 130.

2.2 INTERIOR TRIM

- A. Hardware Lumber Trim for Opaque Finish (Painted Finish):
 - 1. Species and Grade: White maple, Alder, or yellow poplar, A finish.
 - 2. Maximum Moisture Content: 9 percent.

2.3 MISCELLANEOUS MATERIALS

- A. Fasteners for Interior Finish Carpentry: Nails, screws, and other anchoring devices of type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible.
- B. Glue: Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use.
- C. Multipurpose Construction Adhesive: Formulation complying with ASTM D 3498 that is recommended for indicated use by adhesive manufacturer.

2.4 FABRICATION

- A. Back out or kerf backs of the following members, except those with ends exposed in finished work:
 - 1. Interior standing and running trim, except shoe and crown molds.

B. Ease edges of lumber less than 1 inch in nominal thickness to 1/16-inch radius and edges of lumber 1 inch or more in nominal thickness to 1/8-inch radius.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.
- B. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours unless longer conditioning is recommended by manufacturer.

3.3 INSTALLATION, GENERAL

- A. Do not use materials that are unsound; warped; improperly treated or finished; inadequately seasoned; too small to fabricate with proper jointing arrangements; or with defective surfaces, sizes, or patterns.
- B. Install interior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
 - 1. Scribe and cut interior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
 - 2. Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.
 - 3. Install to tolerance of 1/8 inch in 96 inches for level and plumb. Install adjoining interior finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.
 - 4. Coordinate interior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate interior finish carpentry.

3.4 STANDING AND RUNNING TRIM INSTALLATION

- A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 60 inches long, except where necessary. Stagger joints in adjacent and related standing and running trim. Miter at returns, miter at outside corners, and cope at inside corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints. Plane backs of casings to provide uniform thickness across joints where necessary for alignment.
 - 1. Match color and grain pattern of trim for transparent finish (stain or clear finish) across joints.
 - 2. Install trim after gypsum-board joint finishing operations are completed.
 - 3. Install without splitting; drill pilot holes before fastening where necessary to prevent splitting. Fasten to prevent movement or warping. Countersink fastener heads on exposed carpentry work and fill holes.

3.5 ADJUSTING

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

3.6 CLEANING

A. Clean interior finish carpentry on exposed and semiexposed surfaces. Restore damaged or soiled areas and touch up factory-applied finishes if any.

3.7 **PROTECTION**

- A. Protect installed products from damage from weather and other causes during construction.
- B. Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged.
 - 1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 062023

SECTION 064116 - PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Plastic-laminate-faced architectural cabinets.
 - 2. Wood furring, blocking, shims, and hanging strips for installing plastic-laminate-faced architectural cabinets that are not concealed within other construction.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.
- B. Shop Drawings: For plastic-laminate-faced architectural cabinets.
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. All plastic-laminate-faced architectural cabinets are to be constructed in accordance with Architectural Woodwork Institute (AWI) for the grade indicated.
- C. Samples: For each exposed product and for each color and texture specified.

1.4 INFORMATIONAL SUBMITTALS

A. Research reports.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- B. Installer Qualifications: Arrange for installation of architectural woodwork by a firm that can demonstrate successful experience in installing architectural woodwork items similar in type and quality to those required for this project.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect woodwork during transit, delivery, storage, and handling to prevent damage, soilage, and deterioration.
- B. Do not deliver woodwork until painting, wet work, grinding, and similar operations that could damage, soil, or deteriorate woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas whose environmental conditions meet requirements specified in "Project Conditions."

1.7 PROJECT CONDITIONS

- A. Environmental Conditions: Obtain and comply with Woodwork Manufacturer's and Installers coordinated advice for optimum temperature and humidity conditions for woodwork during its storage and installation. Do not install woodwork until these conditions have been attained and stabilized so that woodwork is within plus or minus 1.0 percent of optimum moisture content from date of installation through remainder of construction period.
- B. Field Measurements: Where woodwork is indicated to be fitted to other construction, check actual dimensions of other construction by accurate field measurements before manufacturing woodwork; show recorded measurements on final shop drawings. Coordinate manufacturing schedule with construction progress to avoid delay of Work.

PART 2 - PRODUCTS

2.1 PLASTIC-LAMINATE-FACED ARCHITECTURAL CABINETS

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of cabinets indicated for construction, finishes, installation, and other requirements.
- B. Grade: Custom.
- C. Type of Construction: Frameless.
- D. Door and Drawer-Front Style: Flush overlay.
- E. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicated, as required by quality standard.
- F. Laminate Cladding for Exposed Surfaces:
 - 1. Provide decorative laminates as indicated on Finish Schedule.
 - 2. Edges: PVC edge banding, 0.12 inch (3 mm) thick, matching laminate in color, pattern, and finish.
 - 3. Pattern Direction: As indicated.

- G. Concealed Backs of Panels with Exposed Plastic-Laminate Surfaces: High-pressure decorative laminate, NEMA LD 3, Grade BKL.
- H. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.
 - 1. Join subfronts, backs, and sides with glued rabbeted joints supplemented by mechanical fasteners or glued dovetail joints.
- I. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
 - 1. As indicated on Finish Schedule.

2.2 MATERIALS

- A. General: Provide materials that comply with requirements of the AWI woodworking standard for each type of woodwork and quality grade indicated and, where the following products are part of woodwork, with requirements of the referenced product standards, that apply to product characteristics indicated:
 - 1. High Pressure Laminate: NEMA LD 3.
 - 2. Medium Density Fiberboard: ANSI A208.2.
 - 3. Particleboard: ANSI A208.1
 - 4. Softwood Plywood: PS 1.
 - 5. Hardwood Plywood and Face Veneers: HPVA HP-1.
 - 6. Formaldehyde Emission Levels: Comply with formaldehyde emission requirements of each voluntary standard referenced below:
 - a. Particleboard: NPA 8.
 - b. Medium Density Fiberboard: NPA 9.
 - c. Hardwood Plywood: HPMA FE.
 - 7. For 45-lb-density panels and thicknesses of 3/4 inch and less, comply with ANSI A208.1 for Grade 1-M-1 except that minimums for modules of elasticity and screw-holding capacity on face and edge shall be 300,000 psi, 250 lb, and 225 lb, respectively.

2.3 CABINET HARDWARE AND ACCESSORIES

- A. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 170 degrees of opening.
- B. Catches: Magnetic catches, BHMA A156.9, B03141.
- C. Shelf Rests: BHMA A156.9, B04013; metal, two-pin type with shelf hold-down clip.
- D. Drawer Slides: BHMA A156.9.

- 1. Grade 1HD-100 and Grade 1HD-200: Side mounted; full-extension type; zincplated-steel ball-bearing slides.
- 2. For drawers not more than 3 inches (75 mm) high and not more than 24 inches (600 mm) wide, provide Grade 1.
- 3. For drawers more than 3 inches (75 mm) high, but not more than 6 inches (150 mm) high and not more than 24 inches (600 mm) wide, provide Grade 1HD-100.
- 4. For drawers more than 6 inches (150 mm) high or more than 24 inches (600 mm) wide, provide Grade 1HD-200.
- 5. For computer keyboard shelves, provide Grade 1HD-100.
- 6. For trash bins not more than 20 inches (500 mm) high and 16 inches (400 mm) wide, provide Grade 1HD-200.
- E. Door Locks: BHMA A156.11, E07121.
- F. Drawer Locks: BHMA A156.11, E07041.
- G. Door and Drawer Silencers: BHMA A156.16, L03011.
- H. Grommets for Cable Passage: 2-inch (51-mm) OD, molded-plastic grommets and matching plastic caps with slot for wire passage.
 - 1. Color: As selected by Architect from manufacturer's entire list of color options.
- Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
 Exposed Hardware Finish: Brushed Aluminum.
- J. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

2.4 MISCELLANEOUS MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Soft or Hardwood lumber, kiln-dried to less than 15 percent moisture content.
- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.
- C. Adhesive for Bonding Plastic Laminate: Unpigmented contact cement.
 - 1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

2.5 FABRICATION

- A. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
- B. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Before installation, condition cabinets to humidity conditions in installation areas for not less than 72 hours.
- B. Grade: Install cabinets to comply with quality standard grade of item to be installed.
- C. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with wafer-head cabinet installation screws.
- D. Install cabinet's level, plumb, and true in line to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm) using concealed shims.
 - 1. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
 - 2. Install cabinets without distortion so doors and drawers fit openings and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
 - 3. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches (400 mm) o.c. with No. 10 wafer-head screws sized for not less than 1-1/2-inch (38-mm) penetration into, wood blocking, or hanging strips or No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.

END OF SECTION 064116

SECTION 078123 - INTUMESCENT FIREPROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes mastic and intumescent fire-resistive coatings.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified.

1.4 INFORMATIONAL SUBMITTALS

- A. Product certificates.
- B. Evaluation reports.
- C. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A firm or individual certified, licensed, or otherwise qualified by fireproofing manufacturer as experienced and with sufficient trained staff to install manufacturer's products according to specified requirements.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Assemblies: Provide fireproofing, including auxiliary materials, according to requirements of each fire-resistance design and manufacturer's written instructions.
- B. Fire-Resistance Design: Indicated on Drawings, tested according to ASTM E 119 or UL 263; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

- 1. Steel members are to be considered unrestrained unless specifically noted otherwise.
- C. Asbestos: Provide products containing no detectable asbestos.

2.2 MASTIC AND INTUMESCENT FIRE-RESISTIVE COATINGS

- A. Mastic and Intumescent Fire-Resistive Coating: Manufacturer's standard, factory-mixed formulation or factory-mixed, multicomponent system consisting of intumescent base coat and topcoat, and complying with indicated fire-resistance design.
 - 1. <u>Manufacturers</u>: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Albi Manufacturing; a division of StanChem, Inc.
 - b. Carboline Company; a subsidiary of RPM International.
 - c. Contego International Inc.
 - d. <u>Hilti, Inc</u>.
 - e. International Protective Coatings.
 - f. Isolatek International.
 - g. Sherwin-Williams Company (The).
 - 2. Application: Designated for "interior general purpose" and "conditioned interior space purpose" use by a qualified testing agency acceptable to authorities having jurisdiction.
 - 3. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design.
 - 4. Surface-Burning Characteristics: Comply with ASTM E 84.
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 50 or less.
 - 5. Finish: As selected by Architect from manufacturer's standard finishes.
 - a. Color and Gloss: As selected by Architect from manufacturer's full range.

2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that are compatible with fireproofing and substrates and are approved by UL or another testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance designs indicated.
- B. Substrate Primers: Primers approved by fireproofing manufacturer for the required fire-resistance design.

C. Topcoat: Suitable for application over applied fireproofing; of type recommended in writing by fireproofing manufacturer for each fire-resistance design.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrates and other conditions affecting performance of the Work and according to each fire-resistance design.

3.2 PREPARATION

- A. Cover other work subject to damage from fallout or overspray of fireproofing materials during application.
- B. Prime substrates where included in fire-resistance design and where recommended in writing by fireproofing manufacturer unless compatible shop primer has been applied and is in satisfactory condition to receive fireproofing.
- C. For applications visible on completion of Project, repair substrates to remove surface imperfections that could affect uniformity of texture and thickness in finished surface of fireproofing.

3.3 APPLICATION

- A. Construct fireproofing assemblies that are identical to fire-resistance design indicated and products as specified, tested, and substantiated by test reports; for thickness, primers, topcoats, finishing, and other materials and procedures affecting fireproofing work.
- B. Comply with fireproofing manufacturer's written instructions for mixing materials, application procedures, and types of equipment used to mix, convey, and apply fireproofing; as applicable to particular conditions of installation and as required to achieve fire-resistance ratings indicated.
- C. Spray apply fireproofing to maximum extent possible. After the spraying operation in each area, complete the coverage by trowel application or other placement method recommended in writing by fireproofing manufacturer.
- D. Do not install enclosing or concealing construction until after fireproofing has been applied, inspected, and tested and corrections have been made to deficient applications.
- E. Finishes: Where indicated, apply fireproofing to produce the following finishes:
 - 1. Manufacturer's Standard Finishes: Finish according to manufacturer's written instructions for each finish selected.

- 2. Spray-Textured Finish: Finish left as spray applied with no further treatment.
- 3. Rolled, Spray-Textured Finish: Even finish produced by rolling spray-applied finish with a damp paint roller to remove drippings and excessive roughness.

3.4 FIELD QUALITY CONTROL

- A. Special Inspections: Engage a qualified special inspector to perform the following special inspections:
 - 1. Test and inspect as required by the IBC, Subsection 1705.14, "Mastic and Intumescent Fire-Resistant Coatings."
- B. Fireproofing will be considered defective if it does not pass tests and inspections.
 - 1. Remove and replace fireproofing that does not pass tests and inspections, and retest.
 - 2. Apply additional fireproofing, per manufacturer's written instructions, where test results indicate insufficient thickness, and retest.
- C. Prepare test and inspection reports.

3.5 CLEANING, PROTECTING, AND REPAIRING

- A. Cleaning: Immediately after completing spraying operations in each containable area of Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.
- B. Repair fireproofing damaged by other work before concealing it with other construction.
- C. Repair fireproofing by reapplying it using same method as original installation or using manufacturer's recommended trowel-applied product.

END OF SECTION 078123

SECTION 078443 - JOINT FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Joints in or between fire-resistance-rated constructions.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

A. Product test reports.

1.4 CLOSEOUT SUBMITTALS

A. Installer Certificates: From Installer indicating that joint firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics:
 - 1. Perform joint firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
 - 2. Test per testing standards referenced in "Joint Firestopping Systems" Article. Provide rated systems complying with the following requirements:
 - a. Joint firestopping systems shall bear classification marking of a qualified testing agency.
 - 1) UL in its "Fire Resistance Directory."
 - 2) Intertek Group in its "Directory of Listed Building Products."

2.2 JOINT FIRESTOPPING SYSTEMS

- A. Joint Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which joint firestopping systems are installed. Joint firestopping systems shall accommodate building movements without impairing their ability to resist the passage of fire and hot gases.
- B. Joints in or between Fire-Resistance-Rated Construction: Provide joint firestopping systems with ratings determined per ASTM E1966 or UL 2079.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. 3M Fire Protection Products.
 - b. CEMCO; California Expanded Metal Products Co.
 - c. <u>RectorSeal Firestop; a CSW Industrials Company</u>.
 - d. <u>Specified Technologies, Inc.</u>
 - 2. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of the wall, floor, or roof in or between which it is installed.
- C. Exposed Joint Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E84.
- D. Accessories: Provide components of joint firestopping systems, including primers and forming materials, that are needed to install elastomeric fill materials and to maintain ratings required. Use only components specified by joint firestopping system manufacturer and approved by the qualified testing agency for conditions indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of the Work.
- B. General: Install joint firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.
- C. Install forming materials and other accessories of types required to support elastomeric fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
 - 1. After installing elastomeric fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire-resistive joint system.

- D. Install elastomeric fill materials for joint firestopping systems by proven techniques to produce the following results:
 - 1. Elastomeric fill voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.
 - 2. Apply elastomeric fill materials so they contact and adhere to substrates formed by joints.
 - 3. For elastomeric fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.2 IDENTIFICATION

- A. Joint Identification: Identify joint firestopping systems with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of joint edge so labels are visible to anyone seeking to remove or joint firestopping system. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
 - 1. The words "Warning Joint Firestopping Do Not Disturb. Notify Building Management of Any Damage."
 - 2. Contractor's name, address, and phone number.
 - 3. Designation of applicable testing agency.
 - 4. Date of installation.
 - 5. Manufacturer's name.
 - 6. Installer's name.

3.3 FIELD QUALITY CONTROL

- A. Where deficiencies are found or joint firestopping systems are damaged or removed due to testing, repair or replace joint firestopping systems so they comply with requirements.
- B. Proceed with enclosing joint firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

END OF SECTION 078443

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SECTION 081113 – INTERIOR HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes hollow-metal work.
 - 1. Hollow metal doors & frames, & HM window frames w/ 45 min.fire protected glazing, tempered, & clear ¼", wood doors.
- B. Related Requirements:
 - 1. Division 08 "Door Hardware" for door hardware for hollow-metal doors.

1.3 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.4 COORDINATION

A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, core descriptions, fire-resistance ratings, and finishes.
- B. Shop Drawings: Include the following:
 - 1. Elevations of each door type.
 - 2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
 - 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 - 4. Locations of reinforcement and preparations for hardware.
 - 5. Details of each different wall opening condition.

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- 6. Details of anchorages, joints, field splices, and connections.
- 7. Details of accessories.
- 8. Details of moldings, removable stops, and glazing.
- 9. Details of conduit and preparations for power, signal, and control systems.
- C. Samples for Initial Selection: For units with factory-applied color finishes.
- D. Samples for Verification:
 - 1. For each type of exposed finish required, prepared on Samples of not less than 3 by 5 inches.
 - 2. For "Doors" and "Frames" subparagraphs below, prepare Samples approximately **12 by 12 inches** to demonstrate compliance with requirements for quality of materials and construction:
 - a. Doors: Show vertical-edge, top, and bottom construction; core construction; and hinge and other applied hardware reinforcement. Include separate section showing glazing if applicable.
 - b. Frames: Show profile, corner joint, floor and wall anchors, and silencers. Include separate section showing fixed hollow-metal panels and glazing if applicable.
- E. Schedule: Provide a schedule of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.

1.6 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each type of hollow-metal door and frame assembly, for tests performed by a qualified testing agency.
- B. Oversize Construction Certification: For assemblies required to be fire rated and exceeding limitations of labeled assemblies.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
 - 1. Provide additional protection to prevent damage to factory-finished units.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4inch- high wood blocking. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

2.1 MANUFACTURERS

- A. <u>Manufacturers:</u> Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Apex Industries, Inc.
 - 2. Ceco Door; ASSA ABLOY.
 - 3. Curries Company; ASSA ABLOY.
 - 4. Mesker Door Inc.
 - 5. <u>Republic Doors and Frames</u>.
 - 6. <u>Steelcraft; an Allegion brand</u>.
- B. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

2.2 REGULATORY REQUIREMENTS

- A. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
 - 1. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.
- B. Fire-Rated, Borrowed-Lite Assemblies: Complying with NFPA 80 and listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9.

2.3 INTERIOR DOORS AND FRAMES

- A. Construct interior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Heavy-Duty Doors and Frames: SDI A250.8, Level 2. At locations indicated in the Door and Frame Schedule.
 - 1. Physical Performance: Level B according to SDI A250.4.
 - 2. Doors:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches.
 - c. Face: Metallic-coated, cold-rolled steel sheet, minimum thickness of 0.042 inch.
 - d. Edge Construction: Model 1, Full Flush.

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- e. Core: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core at manufacturer's discretion.
- 3. Frames:
 - a. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch (1.3 mm).
 - b. Sidelite and Transom Frames: Fabricated from same thickness material as adjacent door frame.
 - c. Construction: Face welded.
- 4. Exposed Finish: Prime.
- C. Hollow-Metal Doors and Frames: NAAMM-HMMA 860. At locations indicated in the Door and Frame Schedule.
 - 1. Physical Performance: Level A according to SDI A250.4.
 - 2. Doors:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches
 - c. Face: Uncoated, cold-rolled steel sheet, minimum thickness of 0.032 inch.
 - d. Edge Construction: Continuously welded with no visible seam.
 - e. Core: Steel stiffened.
 - 3. Frames:
 - a. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch for frames that receive hollow-metal doors; minimum thickness of 0.042 inch for frames that receive hollow-core wood doors.
 - b. Sidelite and Transom Frames: Fabricated from same thickness material as adjacent door frame.
 - c. Construction: Face welded.
 - 4. Exposed Finish: Prime.

2.4 BORROWED LITES

- A. Hollow-metal frames of uncoated steel sheet, minimum thickness of **0.053 inch**.
- B. Construction: Face welded.

2.5 HOLLOW-METAL PANELS

A. Provide hollow-metal panels of same materials, construction, and finish as adjacent door assemblies.
- 2.6 FRAME ANCHORS
 - A. Jamb Anchors:
 - 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
 - 2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
 - 3. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.
 - 4. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch- diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.
 - B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch, and as follows:
 - 1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
 - 2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at finish floor surface.

2.7 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.
- D. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.
 - 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- F. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.
- G. Grout: ASTM C 476, except with a maximum slump of 4 inches, as measured according to ASTM C 143/C 143M.
- H. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.
- I. Glazing: Comply with requirements in Division 08 "Glazing."

HOLLOW METAL DOORS AND FRAMES

J. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.8 FABRICATION

- A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Hollow-Metal Doors:
 - 1. Steel-Stiffened Door Cores: Provide minimum thickness 0.026 inch, steel vertical stiffeners of same material as face sheets extending full-door height, with vertical webs spaced not more than 6 inches apart. Spot weld to face sheets no more than 5 inches o.c. Fill spaces between stiffeners with glass- or mineral-fiber insulation.
 - 2. Fire Door Cores: As required to provide fire-protection and temperature-rise ratings indicated.
 - 3. Vertical Edges for Single-Acting Doors: Provide beveled or square edges at manufacturer's discretion.
 - 4. Top Edge Closures: Close top edges of doors with inverted closures, except provide flush closures at exterior doors of same material as face sheets.
 - 5. Bottom Edge Closures: Close bottom edges of doors where required for attachment of weather stripping with end closures or channels of same material as face sheets.
 - 6. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
 - 7. Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.
- C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 - 1. Sidelite and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
 - 2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 - 3. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
 - 4. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
 - 5. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Masonry Type: Locate anchors not more than 16 inches from top and bottom of frame. Space anchors not more than 32 inches o.c., to match coursing, and as follows:
 - 1) Two anchors per jamb up to 60 inches high.

- 2) Three anchors per jamb from 60 to 90 inches high.
- 3) Four anchors per jamb from 90 to 120 inches high.
- 4) Four anchors per jamb plus one additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.
- b. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Three anchors per jamb up to 60 inches high.
 - 2) Four anchors per jamb from 60 to 90 inches high.
 - 3) Five anchors per jamb from 90 to 96 inches high.
 - 4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
- c. Compression Type: Not less than two anchors in each frame.
- d. Postinstalled Expansion Type: Locate anchors not more than 6 inches from top and bottom of frame. Space anchors not more than 26 inches o.c.
- 6. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
 - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- 7. Terminated Stops: Terminate stops **6** inches above finish floor with a 45-degree angle cut, and close open end of stop with steel sheet closure. Cover opening in extension of frame with welded-steel filler plate, with welds ground smooth and flush with frame.
- D. Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.
- E. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
 - 1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
 - 2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.
- F. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
 - 1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
 - 2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
 - 3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
 - 4. Provide loose stops and moldings on inside of hollow-metal work.
 - 5. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

2.9 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
 - 1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

2.10 ACCESSORIES

A. Grout Guards: Formed from same material as frames, not less than 0.016 inch (0.4 mm) thick.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.
- B. Hollow-Metal Frames: Install hollow-metal frames for doors, transoms, sidelites, borrowed lites, and other openings, of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.

1.

- Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. At fire-rated openings, install frames according to NFPA 80.
 - b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - c. Install frames with removable stops located on secure side of opening.
 - d. Install door silencers in frames before grouting.
 - e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - f. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - g. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.
- 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
 - a. Floor anchors may be set with power-actuated fasteners instead of post-installed expansion anchors if so indicated and approved on Shop Drawings.
- 3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
- 4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
- 5. Concrete Walls: Solidly fill space between frames and concrete with mineral-fiber insulation.
- 6. In-Place Concrete or Masonry Construction: Secure frames in place with post-installed expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
- 7. In-Place Metal or Wood-Stud Partitions: Secure slip-on drywall frames in place according to manufacturer's written instructions.
- 8. Installation Tolerances: Adjust hollow-metal door frames for square-ness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.
- C. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
 - 1. Non-Fire-Rated Steel Doors:
 - a. Between Door and Frame Jambs and Head: 1/8 inch plus or minus 1/32 inch.
 - b. Between Edges of Pairs of Doors: 1/8 inch (3.2 mm) to 1/4 inch plus or minus 1/32 inch.

- c. At Bottom of Door: 5/8 inch plus or minus 1/32 inch.
- d. Between Door Face and Stop: 1/16 inch to 1/8 inch plus or minus 1/32 inch.
- 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
- 3. Smoke-Control Doors: Install doors and gaskets according to NFPA 105.
- D. Glazing: Comply with installation requirements in Division 08 "Glazing" and with hollow-metal manufacturer's written instructions.
 - 1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow-metal work immediately after installation.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.
- E. Factory-Finish Touchup: Clean abraded areas and repair with same material used for factory finish according to manufacturer's written instructions.
- F. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 081113

SECTION 083300 SMOKESHIELD FIRE DOORS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Electric operated, automatic closing, overhead rolling fire doors with SmokeShield[®] UL leakage rated assembly label.
- B. Related Section
 - 1. Division 26. Electrical wiring and conduit, fuses, disconnect switches, connection of operator to power supply, installation of control station and wiring, and connection to alarm systems.
- C. Products That May Be Supplied, But Are Not Installed Under This Section:
 - 1. Control Station

1.2 SYSTEM DESCRIPTION

- A. Performance Requirements:
 - 1. Provide doors with Underwriters' Laboratories, Inc. label for the fire rating classification, 4 hr
 - 2. Provide doors with Underwriters' Laboratories, Inc. label for "Leakage Rated Assembly" or "S" label demonstrating product tested to UL 1784
 - a. Comply with NFPA 105 air leakage requirements

1.3 SUBMITTALS

- A. Reference Section 013300–Submittal Procedures; submit the following items:
 - 1. Product Data
 - 2. Shop Drawings: Include special conditions not detailed in Product Data. Show interface with adjacent work.
 - 3. Quality Assurance/Control Submittals:
 - a. Provide manufacturer ISO 9001:2015 registration.
 - b. Provide manufacturer and installer qualifications see 1.4 below.
 - c. Provide manufacturer's installation instructions.
 - 4. Closeout Submittals:
 - a. Operation and Maintenance Manual.
 - b. Certificate stating that installed materials comply with this specification.

1.4 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer Qualifications: ISO 9001:2015 registered and a minimum of five years experience in producing fire and smoke control units of the type specified.
 - 2. Installer Qualifications: Manufacturer's approval.

1.5 DELIVERY STORAGE AND HANDLING

- A. Reference Section 01 66 00–Product Storage and Handling Requirements.
- B. Follow manufacturer's instructions.

1.6 WARRANTY

- A. Standard Warranty: Two years from date of shipment against defects in material and workmanship.
- B. Maintenance: Submit for owner's consideration and acceptance of a maintenance service agreement for installed products.

PART 2 PRODUCTS

- 2.1 MANUFACTURER
 - A. Manufacturer: Cornell: 24 Elmwood Avenue, Mountain Top, PA 18707. Telephone: (800) 233-8366.
 - B. Alternates:
 - 1. Cookson
 - 2. Clopay

2.2 PRODUCT INFO

A. Model: ERD11

2.3 MATERIALS

- A. Curtain:
 - 1. Slats: No. 5F
 - a. Galvanized Steel with Finish as Described Below: No. 5F, minimum 18 gauge, Grade 40 steel, ASTM A 653 galvanized steel zinc coating
 - 2. Finish:
 - a. SpectraShield[®] Coating System:
 - 1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding, gray bakedon base coat and gray baked-on polyester finish coat
 - Zirconium treatment followed by baked-on polyester powder coat, with color as selected by Architect from manufacturer's standard color range, over 180 colors; minimum 2.5 mils cured film thickness; ASTM D-3363 pencil hardness: H or better
- B. Endlocks:

Fabricate interlocking continuous slat sections with high strength steel endlocks secured with two 1/4" rivets per UL requirements.

- C. Bottom Bar:
 - 1. Configuration:
 - a. Structural Steel Angles: 2 structural steel angles minimum 2"x2"x1/8"
 - 2. Finish:
 - a. SpectraShield[®] Coating System:
 - Zirconium treatment followed by baked-on polyester powder coat, with color as selected by Architect from manufacturer's standard color range, over 180 colors; minimum 2.5 mils cured film thickness; ASTM D-3363 pencil hardness: H or better
- D. Guides:
 - 1. Fabrication
 - a. Minimum 3/16 inch structural steel. Top of inner and outer guide angles to be flared outwards to form bellmouth for smooth entry of curtain into guides. Provide removable guide stoppers to prevent over travel of curtain and bottom bar. Top 16 1/2" of coil side guide angles to be removable for ease of curtain installation and as needed for future curtain service.
 - 2. Finish:
 - a. SpectraShield[®] Coating System:
 - Zirconium treatment followed by baked-on polyester powder coat, with color as selected by Architect from manufacturer's standard color range, over 180 colors; minimum 2.5 mils cured film thickness; ASTM D-3363 pencil hardness: H or better
- E. Counterbalance Shaft Assembly:
 - 1. Barrel: Steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot of width
 - 2. Spring Balance: Oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door to ensure that maximum effort to operate will not exceed 25 lbs. Provide wheel for applying and adjusting spring torque.
- F. Brackets: Fabricate from minimum 1/4 inch steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures
 - 1. Finish:
 - a. SpectraShield[®] Coating System:
 - Zirconium treatment followed by baked-on polyester powder coat, with color as selected by Architect from manufacturer's standard color range, over 180 colors; minimum 2.5 mils cured film thickness; ASTM D-3363 pencil hardness: H or better
- G. Hood:

Minimum 24 gauge galvanized steel with reinforced top and bottom edges. Provide minimum 1/4 inch steel intermediate support brackets

- a. SpectraShield[®] Coating System:
 - 1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding, gray bakedon base coat and gray baked-on polyester finish coat
 - Zirconium treatment followed by baked-on polyester powder coat, with color as selected by Architect from manufacturer's standard color range, over 180 colors; minimum 2.5 mils cured film thickness; ASTM D-3363 pencil hardness: H or better

2.4 OPERATION

- A. Motor Operation:
 - 1. AlarmGard Plus Advanced Fire Door Motor Operation with Chain Hoist and Battery Backup: UL, cUL listed NEMA 1 enclosure, horsepower as recommended by manufacturer, 115v single phase service. Provide a totally enclosed non ventilated motor, removable without affecting the setting of limit switches; thermal overload protection, planetary gear reduction, adjustable rotary limit switch mechanism and a transformer with 24v secondary output. All internal electrical components are to be prewired to terminal blocks.
 - a. Provide a failsafe motor operated door assembly requiring no ancillary or externally mounted release devices, cables, chains, pulleys, reset handles or mechanisms
 - b. Equip operator with an emergency manual chain hoist assembly that provides emergency operation during non-alarm power failure.
 - c. Provide an internal electrical failsafe release device that requires no additional wiring, external cables or mounting locations.
 - d. Provide an internal solenoid brake mechanism to hold the door at any position during normal door operation.
 - e. Provide logic for [1] fully monitored safety reversing devices such that the failure of any single monitored device will cause the motor operator to automatically revert to constant pressure to close.
 - f. Electrically activate door system automatic closure by notification from central alarm system or extended power failure.
 - g. Provide an automatic alarm closure selectable time delay of zero or ten seconds.
 - h. Control automatic closure speed with an internal, totally enclosed, variable rate centrifugal governor without the use of electrical pulsation, constant rate viscosity, oscillation type or other exposed governing devices.
 - i. Maintain automatic closure speed at not more than 9" per second.
 - j. Enable safety edge function during alarm closing while power is present for [3] cycles. Enable door to rest upon obstruction following this sequence.
 - k. Electrically reset internal failsafe release device and door operating system upon restoration of electrical power and upon clearing of the alarm signal without requiring human interaction.
 - I. Provide selectable ability for the door system to automatically self-cycle to the fully open position following automatic reset without requiring human interaction.

- m. Provide an integral, non-resettable cycle counter.
- n. Ensure that manual resetting of spring tension, release devices, linkages or mechanical dropouts will not be required.
- o. Provide minimum #50 roller chain for drive connection from motor drive assembly to the door drive shaft.
- p. Install system only with manufacturer supplied or specified fasteners.
- q. Notify electrical contractor to mount control stations and supply the appropriate disconnect switch, all conduit and wiring per the door system wiring instructions.
- r. Drop test and reset door system twice by all means of activation and comply fully with NFPA 80 Section 5.
- B. Control Station:
 - 1. Flush mounted: "Open/Close" key switch with "Best" core cylinder; NEMA 1B
 - 2. Flush mounted: Alarm "Close Test" key switch, NEMA 1
- C. Control Operation:
 - 1. Momentary contact to close:
 - Fail- safe, UL325-2010 Compliant Entrapment Protection for Motor Operation
 - a. Continuously monitored, wireless sensing/weather edge seal extending full width of door bottom bar.

PART 3 EXECUTION

- 3.1 EXAMINATION
 - A. Examine substrates upon which work will be installed and verify conditions are in accordance with approved shop drawings.
 - B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates.
 - C. Commencement of work by installer is acceptance of substrate.

3.2 INSTALLATION

- A. General: Install door and operating equipment with necessary hardware, anchors, inserts, hangers and supports.
- B. Comply with NFPA80 and NFPA 105 and follow manufacturer's installation instructions.

3.3 ADJUSTING

A. Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion.

3.4 FIELD QUALITY CONTROL

A. Site Test: Test doors for normal operation and automatic closing. Coordinate with authorities having jurisdiction to witness test and sign Drop Test Form.

3.5 CLEANING

- A. Clean surfaces soiled by work as recommended by manufacturer.
- B. Remove surplus materials and debris from the site.

3.6 DEMONSTRATION

- A. Demonstrate proper operation, testing and reset procedures to Owner's Representative.
- B. Instruct Owner's Representative in maintenance procedures.

END OF SECTION 083300

SECTION 087100 DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY:

- A. Section Includes: Finish Hardware for door openings, except as otherwise specified herein.
 - 1. Door hardware for steel (hollow metal) doors.
 - 2. Door hardware for aluminum doors.
 - 3. Door hardware for wood doors.
 - 4. Door hardware for other doors indicated.
 - 5. Keyed cylinders as indicated.
- B. Related Sections:
 - 1. Division 6: Rough Carpentry.
 - 2. Division 8: Hollow Metal Doors and Frames.
 - 3. Division 8: Wood Doors.
 - 4. Division 26 Electrical
- C. References: Comply with applicable requirements of the following standards. Where these standards conflict with other specific requirements, the most restrictive shall govern.
 - 1. Builders Hardware Manufacturing Association (BHMA)
 - 2. NFPA 101 Life Safety Code
 - 3. NFPA 80 -Fire Doors and Windows
 - 4. ANSI-A156.xx- Various Performance Standards for Finish Hardware
 - 5. UL10C Positive Pressure Fire Test of Door Assemblies
 - 6. ANSI-A117.1 Accessible and Usable Buildings and Facilities
 - 7. DHI /ANSI A115.IG Installation Guide for Doors and Hardware
 - 8. ICC International Building Code
- D. Intent of Hardware Groups
 - 1. Should items of hardware not definitely specified be required for completion of the Work, furnish such items of type and quality comparable to adjacent hardware and appropriate for service required.
 - 2. Where items of hardware aren't definitely or correctly specified, are required for completion of the Work, a written statement of such omission, error, or other discrepancy to be submitted to Architect, prior to date specified for receipt of bids for clarification by addendum; or, furnish such items in the type and quality established by this specification, and appropriate to the service intended.
- E. Allowances
 - 1. Refer to Division 1 for allowance amount and procedures.
- F. Alternates
 - 1. Refer to Division 1 for Alternates and procedures.

1.2 SUBSTITUTIONS:

A. Comply with Division 1.

1.3 SUBMITTALS:

- A. Comply with Division 1.
- B. Special Submittal Requirements: Combine submittals of this Section with Sections listed below to ensure the "design intent" of the system/assembly is understood and can be reviewed together.
- C. Product Data: Manufacturer's specifications and technical data including the following:
 - 1. Detailed specification of construction and fabrication.
 - 2. Manufacturer's installation instructions.
 - 3. Wiring diagrams for each electric product specified. Coordinate voltage with electrical before submitting.
 - 4. Submit 6 copies of catalog cuts with hardware schedule.
 - 5. Provide 9001-Quality Management and 14001-Environmental Management for products listed in Materials Section 2.2
- D. Shop Drawings Hardware Schedule: Submit 6 complete reproducible copy of detailed hardware schedule in a vertical format.
 - 1. List groups and suffixes in proper sequence.
 - 2. Completely describe door and list architectural door number.
 - 3. Manufacturer, product name, and catalog number.
 - 4. Function, type, and style.
 - 5. Size and finish of each item.
 - 6. Mounting heights.
 - 7. Explanation of abbreviations and symbols used within schedule.
 - 8. Detailed wiring diagrams, specially developed for each opening, indicating all electric hardware, security equipment and access control equipment, and door and frame rough-ins required for specific opening.
- E. Templates: Submit templates and "reviewed Hardware Schedule" to door and frame supplier and others as applicable to enable proper and accurate sizing and locations of cutouts and reinforcing.
 - 1. Templates, wiring diagrams and "reviewed Hardware Schedule" of electrical terms to electrical for coordination and verification of voltages and locations.
- F. Samples: (If requested by the Architect)
 - 1. 1 sample of Lever and Rose/Escutcheon design, (pair).
 - 2. 3 samples of metal finishes
- G. Contract Closeout Submittals: Comply with Division 1 including specific requirements indicated.
 - 1. Operating and maintenance manuals: Submit 3 sets containing the following.
 - a. Complete information in care, maintenance, and adjustment, and data on repair and replacement parts, and information on preservation of finishes.
 - b. Catalog pages for each product.
 - c. Name, address, and phone number of local representative for each manufacturer.
 - d. Parts list for each product.
 - 2. Copy of final hardware schedule, edited to reflect, "As installed".
 - 3. Copy of final keying schedule
 - 4. As installed "Wiring Diagrams" for each piece of hardware connected to power, both low voltage and 110 volts.
 - 5. One set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

1.4 QUALITY ASSURANCE

- A. Comply with Division 1.
 - 1. Statement of qualification for distributor and installers.
 - 2. Statement of compliance with regulatory requirements and single source responsibility.
 - 3. Distributor's Qualifications: Firm with 3 years experience in the distribution of commercial hardware.
 - a. Distributor to employ full time Architectural Hardware Consultants (AHC) for the purpose of scheduling and coordinating hardware and establishing keying schedule.
 - b. Hardware Schedule shall be prepared and signed by an AHC.
 - 4. Installer's Qualifications: Firm with 3 years experienced in installation of similar hardware to that required for this Project, including specific requirements indicated.
 - 5. Regulatory Label Requirements: Provide testing agency label or stamp on hardware for labeled openings.
 - a. Provide UL listed hardware for labeled and 20 minute openings in conformance with requirements for class of opening scheduled.
 - b. Underwriters Laboratories requirements have precedence over this specification where conflict exists.
 - 6. Single Source Responsibility: Except where specified in hardware schedule, furnish products of only one manufacturer for each type of hardware.
- B. Review Project for extent of finish hardware required to complete the Work. Where there is a conflict between these Specifications and the existing hardware, notify the Architect in writing and furnish hardware in compliance with the Specification unless otherwise directed in writing by the Architect.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Packing and Shipping: Comply with Division 1.
 - 1. Deliver products in original unopened packaging with legible manufacturer's identification.
 - 2. Package hardware to prevent damage during transit and storage.
 - 3. Mark hardware to correspond with "reviewed hardware schedule".
 - 4. Deliver hardware to door and frame manufacturer upon request.
- B. Storage and Protection: Comply with manufacturer's recommendations.

1.6 PROJECT CONDITIONS:

- A. Coordinate hardware with other work. Furnish hardware items of proper design for use on doors and frames of the thickness, profile, swing, security and similar requirements indicated, as necessary for the proper installation and function, regardless of omissions or conflicts in the information on the Contract Documents.
- B. Review Shop Drawings for doors and entrances to confirm that adequate provisions will be made for the proper installation of hardware.

1.7 WARRANTY:

- A. Refer to Conditions of the Contract
- B. Manufacturer's Warranty:
 - 1. Closers: Ten years
 - 2. Exit Devices: Five Years

DOOR HARDWARE

- 3. Locksets & Cylinders: Three years
- 4. All other Hardware: Two years.
- 1.8 OWNER'S INSTRUCTION:
 - A. Instruct Owner's personnel in operation and maintenance of hardware units.

1.9 MAINTENANCE:

- A. Extra Service Materials: Deliver to Owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Division 1 Closeout Submittals Section.
 - 1. Special Tools: Provide special wrenches and tools applicable to each different or special hardware component.
 - 2. Maintenance Tools: Provide maintenance tools and accessories supplied by hardware component manufacturer.
 - 3. Delivery, Storage and Protection: Comply with Owner's requirements for delivery, storage and protection of extra service materials.
- B. Maintenance Service: Submit for Owner's consideration maintenance service agreement for electronic products installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

A. The following manufacturers are approved subject to compliance with requirements of the Contract Documents. Approval of manufacturers other than those listed shall be in accordance with Division 1.

ltem:	Manufacturer:	Approved:
Hinges	Stanley	Bommer, McKinney
Continuous Hinges	Stanley	Select, ABH
Locksets	Best	
Cylinders	Best	
Exit Devices	Precision	Von Duprin,
Closers	Stanley D-4550	Dorma 8900, Norton 7500
Access Control System		
Automatic Operators	Stanley D-4990	LCN 4640, Norton
Push/Pull Plates	Trimco	Burns, Rockwood
Push/Pull Bars	Trimco	Burns, Rockwood
Protection Plates	Trimco	Burns, Rockwood
Overhead Stops	ABH	Rixson, Glynn Johnson
Door Stops	Trimco	Burns, Rockwood
Flush Bolts	Trimco	ABH, Burns
Coordinator & Brackets	Trimco	ABH, Burns
Threshold & Gasketing	National Guard	Reese, K.N. Crowder

2.2 MATERIALS:

- A. Hinges: Shall be Five Knuckle Ball bearing hinges
 - 1. Template screw hole locations
 - 2. Bearings are to be fully hardened.
 - 3. Bearing shell is to be consistent shape with barrel.

DOOR HARDWARE

- 4. Minimum of 2 permanently lubricated non-detachable bearings on standard weight hinge and 4 permanently lubricated bearing on heavy weight hinges.
- 5. Equip with easily seated, non-rising pins.
- 6. Non Removable Pin screws shall be slotted stainless steel screws.
- 7. Hinges shall be full polished, front, back and barrel.
- 8. Hinge pin is to be fully plated.
- 9. Bearing assembly is to be installed after plating.
- 10. Sufficient size to allow 180-degree swing of door
- 11. Furnish five knuckles with flush ball bearings
- 12. Provide hinge type as listed in schedule.
- 13. Furnish 3 hinges per leaf to 7 foot 6 inch height. Add one for each additional 30 inches in height or fraction thereof.
- 14. Tested and approved by BHMA for all applicable ANSI Standards for type, size, function and finish
- 15. UL10C listed for Fire rated doors.
- B. Mortise Deadbolt:
 - 1. Tested and approved by ANSI A156.36, Operational Grade 1.
 - 2. Provide 9001-Quality Management and 14001-Environmental Management.
 - 3. Locksets and cores to be of the same manufacturer to maintain complete lockset warranty
 - 4. 2-3/4 inch (70mm) backset
 - 5. 1 inch throw deadbolt
 - 6. Provide locksets with 7-pin core.
- C. Exit Devices:
 - 1. Exit devices to meet or exceed BHMA for ANSI 156.3, Grade 1.
 - 2. Exit devices to be tested and certified by UL or by a recognized independent laboratory for mechanical operational testing to 10 million cycles minimum with inspection confirming Grade 1 Loaded Forces have been maintained.
 - 3. Exit devices chassis to be investment cast steel, zinc dichromate.
 - 4. Exit devices to have stainless steel deadlocking ³/₄" through latch bolt.
 - 5. Exit devices to be equipped with sound dampening on touchbar.
 - 6. Non-fire rated exit devices to have cylinder dogging.
 - 7. Non-fire rated exit devices to have ¼″ minimum turn hex key dogging.
 - 8. Touchpad to be "T" style constructed of architectural metal with matching metal end caps.
 - 9. Touchbar assembly on wide style exit devices to have a ¼″ clearance to allow for vision frames.
 - 10. All exposed exit device components to be of architectural metals and "true" architectural finishes.
 - 11. Provide strikes as required by application.
 - 12. Fire exit hardware to conform to UL10C and UBC 7-2. UL tested for Accident Hazard.
 - 13. The strike is to be black powder coated finish.
 - 14. Exit devices to have field reversible handing.
 - 15. Provide heavy duty vandal resistant lever trim with heavy duty investment cast stainless steel components and extra strength shock absorbing overload springs. Lever shall not require resetting. Lever design to match locksets and latchsets.
 - 16. Provide 9001-Quality Management and 14001-Environmental Management.
 - 17. Vertical Latch Assemblies to have gravity operation, no springs.
 - 18. Exit Device Intruder Function Visual Indicator is to be used in conjunction with the ANSI "10" Function, which allows the outside lever trim to be locked from the inside while the door remains closed. Rim cylinder on the exterior/trim side retracts the latch from the outside.
 - a. Indicator to be actuated by a rim cylinder equipped with a keyed core or thumb-turn.
 - b. Directional indicator feature shall have a large status indicator window with directional pointer embossed into the active case cover to indicate key turn direction to lock and unlock outside lever trim. Labels or stickers are not acceptable.

- c. The status indicator window shall be integrated into the housing of the exit device and is to contain bright reflective material that may be seen in low light conditions.
- d. Indicator window to be protected by impact resistant lens cover.
- e. The action to lock down/unlock shall require a quarter turn (90°) of key or thumb turn.
 - 1) Locked status shall be indicated by a red indicator that will appear under the lens cover with an image of a locked padlock.
 - 2) Unlocked status shall be indicated by a green indicator that will appear under the lens of the cover with an image of an unlocked padlock.
- D. Door Closers shall:
 - 1. Tested and approved by BHMA for ANSI 156.4, Grade 1
 - 2. UL10C certified
 - 3. Provide 9001-Quality Management and 14001-Environmental Management.
 - 4. Closer shall have extra-duty arms and knuckles
 - 5. Conform to ANSI 117.1
 - 6. Maximum 2 7/16 inch case projection with non-ferrous cover
 - 7. Separate adjusting valves for closing and latching speed, and backcheck
 - 8. Provide adapter plates, shim spacers and blade stop spacers as required by frame and door conditions
 - 9. Full rack and pinion type closer with 1¹/₂" minimum bore
 - 10. Mount closers on non-public side of door, unless otherwise noted in specification
 - 11. Closers shall be non-handed, non-sized and multi-sized.
- E. Push Plates: Provide with four beveled edges ANSI J301, .050 thickness, size as indicated in hardware set. Furnish oval-head countersunk screws to match finish.
- F. Pulls with plates: Provide with four beveled edges ANSI J301, .050 thickness Plate s with ANSI J401 Pull as listed in hardware set. Provide proper fasteners for door construction.
- G. Kickplates: Provide with four beveled edges ANSI J102, 10 inches high by width less 2 inches on single doors and 1 inch on pairs of doors. Furnish oval-head countersunk screws to match finish.
- H. Door Bolts: Flush bolts for wood or metal doors.
 - 1. Provide a set of Automatic bolts, Certified ANSI/BHMA 156.3 Type 25 for hollow metal label doors.
 - 2. Provide a set of Automatic bolts, Certified ANSI/BHMA 156.3 Type 27 at wood label doors.
 - 3. Manual flush bolts, Certified ANSI/BHMA 156.16 at openings where allowed local authority.
 - 4. Provide Dust Proof Strike, Certified ANSI/BHMA 156.16 at doors with flush bolts without thresholds.
- I. Coordinator and Brackets: Provide a surface mounted coordinator when automatic bolts are used in the hardware set.
 - 1. Coordinator, Certified ANSI/BHMA A1156.3 Type 21A for full width of the opening.
 - 2. Provide mounting brackets for soffit applied hardware.
 - 3. Provide hardware preparation (cutouts) for latches as necessary.
- J. Magnetic Door Holders: Provide magnetic door holders with Tri-Voltage that can be wired 12VDC, 24V AC/DC or 120V AC
 - 1. Wall magnetic door holders shall be Recessed.
 - 2. Armature shall be thru-bolted and can be provided with any projection required.
 - 3. Models will be available in US28, sprayed finishes and US32D.
 - 4 Floor mounted shall be provided for a single door or double door hold open application.
- K. Seals: All seals shall be finished to match adjacent frame color. Seals shall be furnished as listed in schedule. Material shall be UL listed for labeled openings.

L. Silencers: Furnish silencers on all interior frames, 3 for single doors, 2 for pairs. Omit where any type of seals occur.

2.3 FINISH:

- A. Designations used in Schedule of Finish Hardware 3.05, and elsewhere to indicate hardware finishes are those listed in ANSI/BHMA A156.18 including coordination with traditional U.S. finishes shown by certain manufacturers for their products
- B. Powder coat door closers to match other hardware, unless otherwise noted.
- C. Aluminum items shall be finished to match predominant adjacent material. Seals to coordinate with frame color.

2.4 KEYS AND KEYING:

- A. Provide keyed brass construction cores and keys during the construction period. Construction control and operating keys and core shall not be part of the Owner's permanent keying system or furnished in the same keyway (or key section) as the Owner's permanent keying system. Permanent cores and keys (prepared according to the accepted keying schedule) will be furnished to the Owner.
- B. Cylinders, removable and interchangeable core system: Best CORMAX[™] Patented 7-pin.
- C. Permanent keys and cores: Stamped with the applicable key mark for identification. These visual key control marks or codes will not include the actual key cuts. Permanent keys will also be stamped "Do Not Duplicate."
- D. Transmit Grand Masterkeys, Masterkeys and other Security keys to Owner by Registered Mail, return receipt requested.
- E. Furnish keys in the following quantities:
 - 1. 1 each Grand Masterkeys
 - 2. 4 each Masterkeys
 - 3. 2 each Change keys each keyed core
 - 4. 15 each Construction masterkeys
 - 5. 1 each Control keys
- F. The Owner, or the Owner's agent, will install permanent cores and return the construction cores to the Hardware Supplier. Construction cores and keys remain the property of the Hardware Supplier.
- G. Keying Schedule: Arrange for a keying meeting, and programming meeting with Architect Owner and hardware supplier, and other involved parties to ensure locksets and locking hardware, are functionally correct and keying and programming complies with project requirements. Furnish 3 typed copies of keying and programming schedule to Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of conditions: Examine doors, frames, related items and conditions under which Work is to be performed and identify conditions detrimental to proper and or timely completion.
 - 1. Do not proceed until unsatisfactory conditions have been corrected.

3.2 HARDWARE LOCATIONS:

- A. Mount hardware units at heights indicated in the following publications except as specifically indicated or required to comply with the governing regulations.
 - 1. Recommended Locations for Builder's Hardware for Standard Steel Doors and Frames, by the Door and Hardware Institute (DHI).
 - 2. Recommended locations for Architectural Hardware for flush wood doors (DHI).
 - 3. WDMA Industry Standard I.S.-1A-04, Industry Standard for Architectural wood flush doors.

3.3 INSTALLATION:

- A. Install each hardware item per manufacturer's instructions and recommendations. Do not install surface mounted items until finishes have been completed on the substrate. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- B. Conform to local governing agency security ordinance.
- C. Install Conforming to ICC/ANSI A117.1 Accessible and Usable Building and Facilities.
 - 1. Adjust door closer sweep periods so that from the open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the landing side of the door.
- D. Installed hardware using the manufacturers fasteners provided. Drill and tap all screw holes located in metallic materials. Do not use "Riv-Nuts" or similar products.

3.4 FIELD QUALITY CONTROL AND FINAL ADJUSTMENT

- A. Contractor/Installers, Field Services: After installation is complete, contractor shall inspect the completed door openings on site to verify installation of hardware is complete and properly adjusted, in accordance with both the Contract Documents and final shop drawings.
 - 1. Check and adjust closers to ensure proper operation.
 - 2. Check latchset, lockset, and exit devices are properly installed and adjusted to ensure proper operation.
 - a. Verify levers are free from binding.
 - b. Ensure latchbolts and dead bolts are engaged into strike and hardware is functioning.
 - 3. Report findings, in writing, to architect indicating that all hardware is installed and functioning properly. Include recommendations outlining corrective actions for improperly functioning hardware if required.

3.5 SCHEDULE OF FINISH HARDWARE:

Manufacturer List

<u>Code</u>	Name
BE	Best Access Systems
BY	By Others
DM	Dorma Door Controls
NA	National Guard
PR	Precision
ST	Stanley
TR	Trimco

Option List

<u>Code</u>	Description
FL	Fire Exit Hardware
CSK	COUNTER SINKING OF KICK and MOP PLATES
SN1	SET (4) SEX NUTS - 1 3/4" DOORS (Std)
ER 12	8 3/8"-12" Adj. Ext. Rod - 689 Only
SNB (2)	SEX BOLTS (2)
B4E-HEAVY-KP	BEVELED 4 EDGES - KICK PLATES
Finish List	
<u>Code</u>	<u>Description</u>
600	Primed for Painting
626	Satin Chromium Plated
630	Satin Stainless Steel
689	Aluminum Painted
GREY	Grey
710CU	CuVerro Steralloy
BLACK	Black
US26D	Chromium Plated, Dull

Hardware Sets

SET #01

Doors: 138A

NOTE: All hardware devices to hang, secure, close and gasket opening by overhead door provided.

SET #02

Doors: 138B

6	Hinges	Reuse Existing Hinges		ΒY
1	Removable Mullion	FLKR822	600	PR
1	Mullion Seal	5100N-86 86"		NA
1	Exit Device-Exit Only	FL 2101 SNB (2)	630	PR
1	Exit Device-Storeroom	FL 2103 X 4903D SNB (2)	630	PR
2	Rim Cylinder-Exit Trim/Mullion	12E-72 PATD	626	BE
2	Door Closer	Reuse Existing Door Closers		BY
2	Kick Plate	Reuse Existing Kickplates	630	BY
1	Perimeter Gasketing	Reuse Existing Gasketing		BY
2	Door Silencers	Reuse Existing Silencers	GREY	BY

SET #03,

Doors: 138C, 139A, 139B

3 Hinges	Reuse Existing Hinges		BY
1 Exit Device-Storeroom	FL 2103 X 4903D SNB (2)	630	PR
1 Rim Cylinder	12E-72 PATD	626	BE
1 Door Closer	Reuse Existing Door Closers		BY

1 Kick Plate	Reuse Existing Kickplates	630	BY
1 Perimeter Gasketing	Reuse Existing Gasketing		BY
3 Door Silencers	Reuse Existing Silencers	GREY	BY

SET #04

Doors: 139C

FBB179 4 1/2 X 4 1/2	US26D	ST		
48H-7K PATD	626	BE		
1001-3	710CU	TR		
1018-3	710CU	TR		
8916 SPAT SN1	689	DM		
3820	630	TR		
NOTE: (Install top of inactive door leaf)				
3917-12	626	TR		
3910N	630	TR		
3094B2	BLACK	TR		
K0050 10" x 35" B4E-HEAVY-KP CSK	630	TR		
1270CV	626	TR		
3096	BLACK	TR		
9115 A SET 84"		NA		
5050 C-20 20'		NA		
200 NA 36"		NA		
	FBB179 4 1/2 X 4 1/2 48H-7K PATD 1001-3 1018-3 8916 SPAT SN1 3820 E: (Install top of inactive door leaf) 3917-12 3910N 3094B2 K0050 10" x 35" B4E-HEAVY-KP CSK 1270CV 3096 9115 A SET 84" 5050 C-20 20' 200 NA 36"	FBB179 4 1/2 X 4 1/2 US26D 48H-7K PATD 626 1001-3 710CU 1018-3 710CU 8916 SPAT SN1 689 3820 630 E: (Install top of inactive door leaf) 5917-12 3917-12 626 3910N 630 3094B2 BLACK K0050 10" x 35" B4E-HEAVY-KP CSK 630 1270CV 626 3096 BLACK 9115 A SET 84" 5050 C-20 20' 200 NA 36" L		

SET #05

Doors: 157A, 157B

1	Continuous Hinge	SS300 83"		NA
1	Magnetic Holder	EM 504-24120 ER 12	689	DM
1	Exit Device-Classroom	FL 2108 X V4908D 36" SNB (2)	630	PR
1	Rim Cylinder	12E-72 PATD	626	BE
1	Closer	8916 DS SN1	689	DM
1	Kick Plate	K0050 10" x 34" B4E-HEAVY-KP CSK	630	TR
1	Perimeter Gasketing	5050 C-17 17'		NA

NOTE: Magnetic hold open devices to be tied into the building fire panel and to be release when notified from fire panel.

Opening List

Opening	Hdw Set
138A	01
138B	02
138C	03
139A	03
139B	03
139C	04
157A	05
157B	05

SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Glass for storefront framing.
 - 2. Glazing sealants and accessories.

1.2 COORDINATION

A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches square.
- C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.
- D. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Preconstruction adhesion and compatibility test report.

1.5 QUALITY ASSURANCE

A. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

1.6 PRECONSTRUCTION TESTING

A. Preconstruction Adhesion and Compatibility Testing: Test each glass product, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.

1. Testing is not required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.

1.7 WARRANTY

- A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.
 - 1. Warranty Period: 10 years from date of Substantial Completion.
- B. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. <u>Manufacturers:</u> Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. AGC Glass Company North America, Inc.
 - 2. Pilkington North America.
 - 3. <u>PPG Flat Glass; PPG Industries, Inc</u>.

2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Division 01 "Quality Requirements," to design glazing.
- B. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the International Building Code and ASTM E 1300.
 - 1. Design Wind Pressures: As indicated on Drawings.
 - 2. Design Snow Loads: As indicated on Drawings.
 - 3. Thickness of Patterned Glass: Base design of patterned glass on thickness at thinnest part of the glass.

- 4. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.
- C. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
- D. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
 - 1. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F.
 - 2. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
 - 3. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.3 GLASS PRODUCTS, GENERAL

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
 - 2. AAMA Publications: AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR A7, "Sloped Glazing Guidelines."
 - 3. IGMA Publication for Sloped Glazing: IGMA TB-3001, "Guidelines for Sloped Glazing."
 - 4. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IgCC.
- D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.
- E. Strength: Where annealed float glass is indicated, provide annealed float glass, heatstrengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article where heat-strengthened float glass is indicated. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 GLASS PRODUCTS

- A. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.
- B. Tinted Annealed Float Glass: ASTM C 1036, Type I, Class 2 (tinted), Quality-Q3.
- C. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
- D. Heat-Strengthened Float Glass: ASTM C 1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

2.5 INSULATING GLASS

- A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.
 - 1. Sealing System: Dual seals.
 - 2. Spacer: Thermally broken aluminum.

2.6 GLAZING SEALANTS

- A. General:
 - 1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
 - 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
 - 3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.
- B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.
 - 1. <u>Manufacturers</u>: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. <u>Dow Corning Corporation</u>.
 - b. <u>GE Construction Sealants; Momentive Performance Materials Inc</u>.
 - c. <u>Tremco Incorporated</u>.

2.7 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
 - 1. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
 - 2. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

2.8 MISCELLANEOUS GLAZING MATERIALS

- A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- B. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- C. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- D. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- E. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

PART 3 - EXECUTION

3.1 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where length plus width is larger than 50 inches.
- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

3.2 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Apply heel bead of elastomeric sealant.
- F. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- G. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.3 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

3.4 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.5 CLEANING AND PROTECTION

- A. Immediately after installation remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
 - 1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.
- C. Remove and replace glass that is damaged during construction period.

3.6 GLASS SCHEDULE

- A. Glass Type: Clear, fire-rated ceramic interior vision glass.
 - 1. 3/16" 45-minute fire-rated ceramic glass in accordance with UL 9, UL 10, UL 10B, and NFPA 80 and NFPA 257.

END OF SECTION 088000

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- 1.2 SUMMARY
 - A. Section Includes:
 - 1. Non-load-bearing steel framing systems for interior partitions.
 - 2. Suspension systems for interior ceilings and soffits.
 - 3. Grid suspension systems for gypsum board ceilings.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Studs and Runners: Provide documentation that framing members' certification is according to SIFA's "Code Compliance Certification Program for Cold-Formed Steel Structural and Non-Structural Framing Members."

1.4 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For **embossed steel studs and runners** from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 119 by an independent testing agency.
- B.STC-Rated Assemblies: For STC-rated assemblies, provide materials and constructionNON-STRUCTURAL METAL092216 1/11

identical to those tested in assembly indicated, according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

- C. Horizontal Deflection: For wall assemblies, limited to 1/240 of the wall height based on horizontal loading of 10 lbf/sq. ft.
- D. Intumescent paint fire protection for new steel.

2.2 FRAMING SYSTEMS

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
 - 1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
 - 2. Protective Coating: ASTM A 653/A 653M, G40 hot-dip galvanized unless otherwise indicated.
- B. Studs and Runners: ASTM C 645. Use either steel studs or runners or embossed steel studs and runners.
 - 1. Steel Studs and Runners:
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) CEMCO; California Expanded Metal Products Co.
 - 2) MBA Building Supplies.
 - 3) Phillips Manufacturing Co.
 - 4) SCAFCO Steel Stud Company.
 - 5) Steel Network, Inc. (The).
 - b. Minimum Base-Metal Thickness: As required by performance requirements for horizontal deflection.
 - c. Depth: As indicated on Drawings.
 - 2. Embossed Steel Studs and Runners:
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) CEMCO; California Expanded Metal Products Co.

- 2) Phillips Manufacturing Co.
- 3) SCAFCO Steel Stud Company.
- 4) Steel Network, Inc. (The).
- b. Minimum Base-Metal Thickness: As required by horizontal deflection performance requirements.
- c. Depth: As indicated on Drawings.
- C. Slip-Type Head Joints: Where indicated, provide one of the following:
 - 1. Clip System: Clips designed for use in head-of-wall deflection conditions that provide a positive attachment of studs to runners while allowing 3-inch minimum vertical movement.
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) CEMCO; California Expanded Metal Products Co.
 - 2) MarinoWARE.
 - 3) SCAFCO Steel Stud Company.
 - 4) Steel Network, Inc. (The).
 - 2. Double-Runner System: ASTM C 645 top runners, inside runner with 2-inchdeep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.
 - 3. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) CEMCO; California Expanded Metal Products Co.
 - 2) SCAFCO Steel Stud Company.
 - 3) Steel Network, Inc. (The).
- D. Firestop Tracks: Top runner manufactured to allow partition heads to expand and contract with movement of structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. CEMCO; California Expanded Metal Products Co.
- b. ClarkDietrich Building Systems.
- c. MarinoWARE.
- d. SCAFCO Steel Stud Company.
- e. Steel Network, Inc. (The).
- E. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. ClarkDietrich Building Systems.
 - b. MarinoWARE.
 - c. MRI Steel Framing, LLC.
 - d. SCAFCO Steel Stud Company.
 - 2. Minimum Base-Metal Thickness: As indicated on Drawings.
- F. Cold-Rolled Channel Bridging: Steel, 0.0538-inch minimum base-metal thickness, with minimum 1/2-inch- wide flanges.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. ClarkDietrich Building Systems.
 - b. MarinoWARE.
 - c. MRI Steel Framing, LLC.
 - d. SCAFCO Steel Stud Company.
 - 2. Depth: As indicated on Drawings.
 - 3. Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.068-inch- thick, galvanized steel.
 - G. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. ClarkDietrich Building Systems.
 - b. MarinoWARE.
 - c. MRI Steel Framing, LLC.
 - d. SCAFCO Steel Stud Company.

- 2. Minimum Base-Metal Thickness: As indicated on Drawings.
- 3. Depth: As indicated on Drawings.
- H. Resilient Furring Channels: 1/2-inch- deep, steel sheet members designed to reduce sound transmission.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. ClarkDietrich Building Systems.
 - b. MarinoWARE.
 - c. MRI Steel Framing, LLC.
 - d. SCAFCO Steel Stud Company.
 - 2. Configuration: Asymmetrical or hat shaped.
- I. Cold-Rolled Furring Channels: 0.053-inch uncoated-steel thickness, with minimum 1/2-inch- wide flanges.
 - 1. Depth: As indicated on Drawings.
 - 2. Furring Brackets: Adjustable, corrugated-edge-type steel sheet with minimum uncoated- steel thickness of 0.0329 inch.
 - 3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inchdiameter wire, or double strand of 0.048-inch- diameter wire.
- J. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, minimum uncoated-metal thickness of 0.0179 inch, and depth required to fit insulation thickness indicated.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. ClarkDietrich Building Systems.
 - b. MarinoWARE.
 - c. MRI Steel Framing, LLC.

2.3 SUSPENSION SYSTEMS

- A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- diameter wire, or double strand of 0.048-inch- diameter wire.
- B. Hanger Attachments to Concrete:
- 1. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E 488/E 488M conducted by a qualified testing agency.
- 2. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.
- C. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inch in diameter.
- D. Flat Hangers: Steel sheet, 1 by 3/16 inch by length indicated.
- E. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.0538 inch and minimum 1/2-inch- wide flanges.
 - 1. Depth: As indicated on Drawings.
- F. Furring Channels (Furring Members):
 - 1. Cold-Rolled Channels: 0.0538-inch uncoated-steel thickness, with minimum 1/2-inch- wide flanges, 3/4 inch deep.
 - 2. Steel Studs and Runners: ASTM C 645.
 - a. Minimum Base-Metal Thickness: As indicated on Drawings.
 - b. Depth: As indicated on Drawings.
 - 3. Embossed Steel Studs and Runners: ASTM C 645.
 - a. Minimum Base-Metal Thickness: As indicated on Drawings.
 - b. Depth: As indicated on Drawings.
 - 4. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch deep.
 - a. Minimum Base-Metal Thickness: As indicated on Drawings.
 - 5. Resilient Furring Channels: 1/2-inch-deep members designed to reduce sound transmission.
 - a. Configuration: Asymmetrical or hat shaped.
- G. Grid Suspension System for Gypsum Board Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one

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of the following:

- a. Armstrong World Industries, Inc.
- b. United States Gypsum Company.

2.4 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
 - 1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Exterior Walls: Provide one of the following:
 - 1. Asphalt-Saturated Organic Felt: ASTM D 226/D 226M, Type I (No. 15 asphalt felt), no perforated.
 - 2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.
 - 1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

- 1. Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling runners (tracks) to surfaces indicated to receive sprayed fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than 24 inches o.c.
- 2. After sprayed fire-resistive materials are applied, remove them only to extent necessary for installation of non-load-bearing steel framing. Do not reduce thickness of fire- resistive materials below that are required for fire-resistance ratings indicated. Protect adjacent fire-resistive materials from damage.

3.3 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754.
 - 1. Gypsum Plaster Assemblies: Also comply with requirements in ASTM C 841 that apply to framing installation.
 - 2. Portland cement Plaster Assemblies: Also comply with requirements in ASTM C 1063 that apply to framing installation.
 - 3. Gypsum Veneer Plaster Assemblies: Also comply with requirements in ASTM C 844 that apply to framing installation.
 - 4. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.
- C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- D. Install bracing at terminations in assemblies.
- E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 INSTALLING FRAMED ASSEMBLIES

A. Install framing system components according to spacing's indicated, but not greater than spacing's required by referenced installation standards for assembly types.

- 1. Single-Layer Application: As required by horizontal deflection performance requirements unless otherwise indicated.
- 2. Multilayer Application: As required by horizontal deflection performance requirements unless otherwise indicated.
- 3. Tile Backing Panels: As required by horizontal deflection performance requirements unless otherwise indicated.
- B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- C. Install studs so flanges within framing system point in same direction.
- D. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.
 - 1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
 - 2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb unless otherwise indicated.
 - b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
 - c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
 - 3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
 - 4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistancerated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
 - a. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.
 - 5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
 - 6. Curved Partitions:
 - a. Bend track to uniform curve and locate straight lengths so they are tangent to arcs.

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- b. Begin and end each arc with a stud, and space intermediate studs equally along arcs. On straight lengths of no fewer than two studs at ends of arcs, place studs 6 inches o.c.
- E. Direct Furring:
 - 1. Screw to wood framing.
 - 2. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.
- F. Z-Shaped Furring Member
 - 1. Erect insulation, specified in Section 072100 "Thermal Insulation," vertically and hold in place with Z-shaped furring members spaced 24 inches o.c.
 - 2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.
 - 3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches from corner and cut insulation to fit.
- G. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.5 INSTALLING SUSPENSION SYSTEMS

- A. Install suspension system components according to spacing's indicated, but not greater than spacing's required by referenced installation standards for assembly types.
 - 1. Carrying Channels (Main Runners): 48 inches o.c.
 - 2. Furring Channels (Furring Members): 16 inches o.c.
- B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
- C. Suspend hangers from building structure as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
 - a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, counters playing, or other equally effective means.

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- 2. Where width of ducts and other construction within ceiling plenum produces hanger spacing's that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
 - a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.
- 3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
- 4. Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.
- 5. Do not attach hangers to steel roof deck.
- 6. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
- 7. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
- 8. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.
- E. Seismic Bracing: Sway-brace suspension systems with hangers used for support...
- F. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.
- G. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Interior gypsum board.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each texture finish indicated on same backing indicated for Work.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

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

2.3 INTERIOR GYPSUM BOARD

- A. Gypsum Wallboard: ASTM C 1396/C 1396M.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
 - a. <u>CertainTeed Corporation</u>.
 - b. <u>Georgia-Pacific Building Products</u>.
 - c. National Gypsum Company.
 - d. United States Gypsum Company.

- 2. Thickness: 5/8 inch
- 3. Long Edges: Tapered.
- B. Gypsum Board, Type X: ASTM C 1396/C 1396M.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTeed Corporation.
 - b. Georgia-Pacific Building Products.
 - c. National Gypsum Company.
 - d. <u>United States Gypsum Company</u>.
 - 2. Thickness: 5/8 inch
 - 3. Long Edges: Tapered.
- C. Gypsum Ceiling Board: ASTM C 1396/C 1396M.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
 - a. <u>CertainTeed Corporation</u>.
 - b. Georgia-Pacific Building Products.
 - c. National Gypsum Company.
 - d. <u>United States Gypsum Company</u>.
 - 2. Thickness: 5/8 inch
 - 3. Long Edges: Tapered.

2.4 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
 - 1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paperfaced galvanized-steel sheet.
 - 2. Shapes:
 - a. Cornerbead.
 - b. Bullnose bead.
 - c. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - d. L-Bead: L-shaped; exposed long flange receives joint compound.
 - e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
 - f. Expansion (control) joint.
 - g. Curved-Edge Cornerbead: With notched or flexible flanges.

2.5 JOINT TREATMENT MATERIALS

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

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- B. Joint Tape:
 - 1. Interior Gypsum Board: Paper.
 - 2. Exterior Gypsum Soffit Board: Paper.
 - 3. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
 - 4. Tile Backing Panels: As recommended by panel manufacturer.
- C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
 - 1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
 - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 - 3. Fill Coat: For second coat, use setting-type, sandable topping compound.
 - 4. Finish Coat: For third coat, use setting-type, sandable topping compound.
 - 5. Skim Coat: For final coat of Level 5 finish, use high-build interior coating product designed for application by airless sprayer and to be used instead of skim coat to produce Level 5 finish.

2.6 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
- C. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.
 - 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
 - 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

PART 3 - EXECUTION

3.1 APPLYING AND FINISHING PANELS

- A. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- B. Comply with ASTM C 840.
- C. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch- wide spaces at these locations and trim edges with

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- 02419 Alabama A&M University Knight Complex Cafeteria Renovations edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
 - D. For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
 - E. Prefill open joints, rounded or beveled edges, and damaged surface areas.
 - F. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
 - G. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
 - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 - 2. Level 2: Panels that are substrate for tile.
 - 3. Level 3: Interior shafts or ventilation areas
 - 4. Level 4: All surfaces that will be exposed to view, unless otherwise indicated.
 - a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."
 - H. Glass-Mat Gypsum Sheathing Board: Finish according to manufacturer's written instructions for use as exposed soffit board.
 - I. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.
 - J. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.2 **PROTECTION**

- A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- B. Remove and replace panels that are wet, moisture damaged, and mold damaged.

SECTION 093013 - CERAMIC TILING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Quarry tile.
 - 2. Porcelain tile.
 - 3. Ceramic wall tile.
 - 4. Tile backing panels.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples:
 - 1. Each type and composition of tile and for each color and finish required.
 - 2. Assembled samples mounted on a rigid panel, with grouted joints, for each type and composition of tile and for each color and finish required.
 - 3. Stone thresholds.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.4 MAINTENANCE MATERIAL SUBMITTALS

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

1.5 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Installer employs at least one installer for Project that has completed the Advanced Certification for Tile Installers (ACT) certification for installation of gauged porcelain tile/gauged porcelain tile panels and slabs.

PART 2 - PRODUCTS SEE FINISH SCHEDULE.

2.1 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide Standard-grade tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.
- 2.2 TILE PRODUCTS

2.3 THRESHOLDS

A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.

2.4 TILE BACKING PANELS

- A. Cementitious Backer Units: ANSI A118.9 or ASTM C1325, Type A.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. C-Cure.
 - b. <u>Custom Building Products</u>.
 - c. <u>FinPan, Inc</u>.
 - d. <u>Georgia-Pacific Gypsum LLC</u>.
 - e. USG Corporation.
- B. Fiber-Cement Backer Board: ASTM C1288.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. <u>CertainTeed Corporation</u>.
 - b. Custom Building Products.
 - c. James Hardie Building Products, Inc.

2.5 WATERPROOF MEMBRANE

A. General: Manufacturer's standard product that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

2.6 SETTING MATERIALS

A. Portland Cement Mortar (Thickset) Installation Materials: ANSI A108.02.

2.7 GROUT MATERIALS

A. Sand-Portland Cement Grout: ANSI A108.10, as required to produce color indicated.

2.8 MISCELLANEOUS MATERIALS

- A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cementbased formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
- B. Floor Sealer: Manufacturer's standard product for sealing grout joints and that does not change color or appearance of grout.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Bonsal American, an Oldcastle company.
 - b. <u>Custom Building Products</u>.
 - c. Jamo Inc.
 - d. Southern Grouts & Mortars, Inc.
 - e. <u>Summitville Tiles, Inc</u>.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

- B. Floor filler at recess floor : floor leveler to provide level subsurface for new tile floors: decoupling membrane for floor tile to prevent cracking.
- C. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
 - 1. Verify that concrete substrates for tile floors comply with surface finish requirements in ANSI A108.01 for installations indicated.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with adhesives or thinset mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.
- B. Where indicated, prepare substrates to receive waterproof membrane by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains.
- C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.3 INSTALLATION

- A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
 - 1. For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:
 - a. Exterior tile floors.
 - b. Tile floors in wet areas.
 - c. Tile floors consisting of tiles 8 by 8 inches or larger.
 - d. Tile floors consisting of rib-backed tiles.
- B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

- C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.
- E. Where accent tile differs in thickness from field tile, vary setting bed thickness so that tiles are flush.
- F. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
- G. Joint Widths: Unless otherwise indicated, install tile with the following joint widths: SEE FINISH SCHEDULE.
- H. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
- I. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
 - 1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
- J. Floor Sealer: Apply floor sealer to cementitious grout joints in tile floors according to floorsealer manufacturer's written instructions. As soon as floor sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.
- K. Install tile backing panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated.
- L. Install waterproof membrane to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness that is bonded securely to substrate.

3.4 INTERIOR CERAMIC TILE INSTALLATION: SEE FINISH SCHEDULE

SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes acoustical panels and exposed suspension systems for interior ceilings.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified.
- C. Coordination Drawings: Reflected ceiling plans, drawn to scale, and coordinated with each other, using input from installers of the items involved.
- 1.4 CLOSEOUT SUBMITTALS
 - A. Maintenance data.

PART 2 - PRODUCTS

2.1 ACOUSTICAL PANELS

- A. Products: See Finish Schedule & Reflected Ceiling Plans for product surface finishes, sizes, and associated grids.
- B. Basis of Design: Match existing.
- C. Unless otherwise noted in drawings, substitutions from manufacturers providing products and materials that match design, size, color, composition, finish, and profiles; will be acceptable, subject to final review and acceptance by the Architect.
- D. Acoustical Panel Standard: Manufacturer's standard panels according to ASTM E 1264.

2.2 METAL SUSPENSION SYSTEM

A. Products: Match existing.

ACOUSTICAL PANEL CEILINGS

2.3 ACCESSORIES

- A. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
- B. Hold-Down Clips: Manufacturer's standard hold-down.
- C. Impact Clips: Manufacturer's standard impact-clip system designed to absorb impact forces against acoustical panels.

2.4 METAL EDGE MOLDINGS AND TRIM

- A. Products: Match existing.
- B. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated.
- B. Layout openings for penetrations centered on the penetrating items.

3.2 INSTALLATION

- A. Install acoustical panel ceilings according to ASTM C 636/C 636M, seismic design requirements, and manufacturer's written instructions.
- B. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
 - 1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
 - 2. Do not use exposed fasteners, including pop rivets, on moldings and trim.
 - 3. Arrange directionally patterned acoustical panels as follows:
 - a. As indicated on reflected ceiling plans.
 - 4. Install hold-down and seismic clips in areas indicated; space according to panel manufacturer's written instructions unless otherwise indicated.

END OF SECTION 095113

ACOUSTICAL PANEL CEILINGS

SECTION 095813- MONOLITHIC ACOUSTICAL CEILING SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:1. Acoustical Insulation for perforated gypsum board ceilings.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Subcontractor is an experienced Installer, approved and trained by product manufacturer to properly install ceiling system.
 - 1. Subcontractor shall provide documentation that they are certified installers of the USG Ensemble[™] Ceiling System.
 - 2. Subcontractor shall utilize approved equipment and procedures for proper installation.
- B. Source Limitations: The Ensemble Ceiling is to be purchased and installed by a certified single-source provider.

1.5 COORDINATION:

- A. Pre-installation conference: Conduct conference at project site.
- B. Coordinated Shop Drawings: Contractor shall submit coordinated shop drawings that clearly indicate the following components for Architect Approval prior to installation. Shop drawings shall include device alignment, dimensions, center lines and indicate the following:
 - 1. Access panels.
 - 2. Ceiling devices.
 - 3. Ceiling framing.
 - 4. Changes in ceiling height elevation.

- 5. Control joints
- 6. Life safety devices.
- 7. Light fixtures.
- 8. Miscellaneous items located on ceiling.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original, unopened packaging and store in an enclosed shelter providing protection from damage and exposure to the elements.
 - 1. Store within temperature limits required by manufacturer.
 - 2. Store Ensemble[™] panels flat.
 - 3. Comply with manufacturer's requirements for safety and handling.
- B. Discard joint compounds and sealants that cannot be applied within their stated shelf life.
- C. Store accessory materials in a location with constant ambient temperatures of 50 to 80 °F (15 to 27 °C). Avoid exposure to sustained temperatures exceeding 125 °F (52 °C).

1.7 FIELD CONDITIONS

- A. Install Ensemble system in an indoor environment that is climate controlled.
- B. Comply with ASTM C840 requirements for interior drywall installation: Maintain room temperatures at greater than 40 °F (4.4 °C) at least 48 hours before panel installation and greater than 50 °F (10 °C) at least 48 hours before joint treatment or spray-applied finish application, and continuously during and after application.
- C. Avoid exposure and protect from excessive, repetitive or continuous moisture before, during and after installation. Eliminate sources of moisture immediately.
- D. Adequate ventilation shall be maintained in the working area during installation and curing period.

1.8 WARRANTY

A. Product is furnished as is to the contractor.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

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

2.2 MONOLITHIC SOUND ABSORBING GYPSUM BOARD SYSTEM

- A. Sound Absorbing Gypsum Ceiling Framing System:
 - 1. **Basis of Design**: Subject to compliance with project requirements, the design is based on the following: USG Interiors, LLC, "USG ENSEMBLE[™] ACOUSTICAL DRYWALL SYSTEM".

2.3 ACOUSTICAL BACKER PANEL

- A. Acoustical Backer Panel: USG Interiors, LLC, "USG Ensemble™ High-NRC Backer Panel".
 - 1. Classification: Provide un-faced acoustical panels with the following physical attributes:
 - a. NRC: Not less than 0.80.
 - b. CAC: Not less than 40.
 - c. Edge/Joint Detail: SQ Square.
 - d. Modular Size: 23.5 by 48 inches (596.9 by 1220 mm).
 - e. Recycled Content: Not less than 66%.
 - 2. High Recycled Content Product: Classified as containing greater than 50% total recycled content. Total recycled content is based on product composition of post-consumer and pre-consumer post-industrial recycled content per FTC guidelines.
 - 3. VOC Emissions: Meets CA Specification 01350, CHPS listed for low emitting materials.

2.4 CEILING PANEL JOINT TREATMENT

- A. Perforated Gypsum Board Joint Treatment.
 - 1. General: Comply with ASTM C 475/C 475M, Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.

2.5 CEILING PANEL SPRAY-APPLIED FINISH

A. Acoustically Transparent Finish

1. Finish: SEE FINISH SCHEDULE.

- a) Benjamin Moore
- b) Sherwin Williams

2.6 ACCESSORIES

A. Gypsum Board Trim Accessories.

- 1. Trim Accessories: Galvanized steel sheet per ASTM 1047: Provide manufacturer approved and tested metal trim that is chemically compatible with the specified ceiling system.
- B. Extruded-Aluminum Edge Moldings and Trim.
 - 1. Where indicated, provide manufacturer's extruded-aluminum edge moldings and trim of profile indicated or referenced by manufacturer's designations, including splice plates, corner pieces, and attachment and other clips, complying with seismic design requirements and the following: Provide manufacturer approved and tested metal trim that is chemically compatible with the specified ceiling system.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, verify that installed building services to not interfere with work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.
 - 1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

3.3 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754.
 - 1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install framing and accessories plumb, and true to line, with connections securely fastened.
- C. Install drywall suspension grid framing, and blocking to support fixtures, equipment services, demountable partition supports, or similar construction.
- D. Install bracing at terminations in assemblies.
- E. This product system installation is similar to a conventional drywall installation. However, there are some differences in both materials and methods of installation that make this system unique. Installers should review and follow all directions of this installation instruction guide.

F. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 INSTALLING FRAMING SYSTEM

- A. Suspended System
 - 1. Determine the finished ceiling height. If the ceiling extends to the sidewalls, screw attach DGWM24 wall angle to the sidewalls at 5/8" above the finished ceiling height. Fasteners must be in the framing members. Attach hanger wires to structure above using the appropriate method. Hanger wires shall be spaced 48" OC max in each direction. Using pliers, bend the hanger wires.
 - 2. Insert the hanger wires through the utility holes in the DGLW26 Main Tees. The DGLW26 Main Tees will run perpendicular to the cross tees at 48" OC max. The hanger wires must be within 5 degrees of plumb. Secure the DGLW-424 cross tees to the indexed support bars by snapping the clip into the cross tee holes on the main tee.
 - 3. Space the cross tees at 24" OC. If the ceiling extends wall to wall, square up the main tees and screw attach to the DGWM24 wall angle.

3.5 Perforated Gypsum Board Installation

- A. The USG Sheetrock Brand Ensemble[™] Panels can be cut like standard Sheetrock wallboard panels using a T square and utility knife. Score the face of the panels at the desired length, making sure to cut completely through the fiberglass face scrim. Snap the panels and then cut completely through the back scrim. No marks can be made in the field of the panels unless they are covered by USG Sheetrock[®] brand Ensemble[™] Ceiling Compound prior to spraying. (I.e. pencil, marker, or similar).
- B. Fasten the perforated panels at 12" OC using 1-1/4" fine thread bugle head drywall screws. The fasteners must be in the field of the board, not the perforations. The fastener head should be just below the surface without tearing the fiberglass scrim.
- C. A router or keyhole saw can be used to cut penetrations like standard wallboard.
- D. Install beads and trims using the same method as standard wallboard. If the ceiling design is a floating island, trim the perimeter using Compasso Elite for Drywall.
- 3.6 Joint Finishing
 - A. The joints are finished using the USG Sheetrock[®] Brand All Purpose Joint Compound, Sheetrock[®] Brand Paper Joint Tape, and USG Sheetrock[®] Brand Ensemble[™] Ceiling Compound. It is imperative to finish the joints as flat and level with the surface of the board as possible. Even slightly hollow or crowned joints will show as imperfections under critical lighting after the finish is applied.

- B. Embed joint tape with the All Purpose Joint Compound. This can be done by hand with a joint knife, or a standard bazooka. Wipe excess with a joint knife and allow to dry completely.
- C. Spot all fastener heads with USG Sheetrock[®] Brand Ensemble[™] Ceiling Compound using a 1" or 2" joint knife. Keep the compound area small to minimize covering the perforations.
- D. After the tape and bed coat is dry, apply the first coat of USG Sheetrock[®] Brand Ensemble[™] Ceiling Compound over the joints. This can be done using hand tools or a 12" box with the blade set flat. Check for flatness with a 20" knife.
- E. Apply the first fill coat of ceiling compound to all beads and trims. Apply second coat to fasteners. Allow to dry completely. Sand joints to remove any excess joint compound. A light sanding of the entire surface will help prep for the spray process but avoid over sanding the fiberglass scrim as much as possible. Apply a finish coat to the joints using a 14" offset blade knife (or similar).
- F. Apply a finish coat to all beads and trims using the appropriate width joint knife so that the possibility of shadowing is minimized. Apply a third coat to the fasteners if required. Allow to dry completely. Check all joints, beads, and trims for flatness using a 20" wide knife or straight edge.
- G. All joints must be filled and leveled with the surface of the board. Crowned joints must be sanded level using a flat sander. It is important to thoroughly check each joint down the entire length for flatness, not just at a few random locations.
- 3.7 Spray-Applied Finish
 - A. Note: The proper spray equipment must be used to achieve acoustical performance and esthetics.
 - B. Please contact your local USG Contractor Specialty Representative for specifications of required spray equipment to apply Ensemble[™] Spray-Applied Finish.
 - C. Mask off all areas that need protecting from overspray with plastic sheathing. Use a floor protector as required. Set up the spray machine and compressor using the proper hoses. Set the air and material pressure to achieved desired finish.
 - D. Spray Applied Finish must be thoroughly mixed prior to application. Mix it in the 4.5gallon container prior to filling the spray machine hopper. Using a 450-rpm electric drill and a high shear paddle mixer, thoroughly blend the finish until it has a smooth, creamy consistency. Up to 20 oz. clean, potable water may be added to achieve the proper spray consistency.
 - E. Check for proper consistency using the material thickness gauge provided by the spray equipment manufacturer (small steel ball). If the ball sinks completely, the fine finish is ready to spray. If the ball does not sink within 3 seconds, add more water 4 oz. at a time (up to 20 oz.) and mix thoroughly until the ball sinks.

- F. Prime sprayer equipment with 5 gallons of clean potable water. With the nozzle air off, cycle water through the hose and spray gun back into the hopper for 30 seconds and then drain out the water out of the hopper. Pour the 5 gallons of mixed finish into the hopper. With the nozzle air still off, cycle the remaining water out of the hose into a separate container. When the spray finish has reached the gun, cycle the spray finish through the hose and gun back into the hopper until it is flowing smoothly through the machine.
- G. The Ensemble[™] Spray-Applied Finish must be applied in a minimum of four coats to achieve the proper appearance and sound performance. Apply each coat very lightly with 36" minimum gun clearance. Start in one corner and work progressively across the ceiling. Immediately cross hatch. Once the finish is dry to the touch (approx. 20-40 min), use a drywall squeegee to remove excess spray droplets, then recoat using the same technique. Apply successive coats until the desired appearance is achieved and the perforations are no longer visible through the finish.
- H. After the final coat, wait 24 hours and then remove any minor irregularities with a soft rubber bladed squeegee trowel.
- I. Maintain proper jobsite conditions and wear proper protective equipment (safety goggles, NIOSH- approved respirator, coveralls) while applying the finish.

SECTION 096513 - RESILIENT BASE AND ACCESSORIES

1.1 SUMMARY

- A. Section Includes:
 - 1. Resilient base.
 - 2. Resilient molding accessories.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified, not less than 12 inches long.

PART 2 - PRODUCTS

2.1 THERMOSET-RUBBER BASE

- A. <u>Manufacturers:</u> Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Flexco.
 - 2. Johnsonite; a Tarkett company.
 - 3. <u>Roppe Corporation, USA</u>.
- B. Product Standard: ASTM F 1861, Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous).
 - 1. Style and Location:
 - a. Match existing.
- C. Thickness: 0.125 inch
- D. Height: Match existing.
- E. Lengths: Cut lengths 48 inches long or coils in manufacturer's standard length.
- F. Outside Corners: Preformed.
- G. Inside Corners: Preformed.
- H. Colors: Match existing.

2.2 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.
- C. Stair-Tread Nose Filler: Two-part epoxy compound recommended by resilient stair-tread manufacturer to fill nosing substrates that do not conform to tread contours.
- D. Floor Polish: Provide protective, liquid floor-polish products recommended by resilient stair-tread manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates for Resilient Stair Accessories: Prepare horizontal surfaces according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
 - 4. Moisture Testing: Proceed with installation only after substrates pass testing according to manufacturer's written recommendations, but not less stringent than the following:
 - a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft in 24 hours.
 - b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have maximum 75 percent relative humidity level.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

- D. Do not install resilient products until they are the same temperature as the space where they are to be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.2 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.

3.3 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
- B. Floor Polish: Remove soil, visible adhesive, and surface blemishes from resilient stair treads before applying liquid floor polish.
 - 1. Apply two coat(s).
- C. Cover resilient products subject to wear and foot traffic until Substantial Completion.

3.4 PRODUCT DATA SHEET

- A. Provide resilient accessories; in addition to others specified on drawings, as follows:
 - 1. Match existing conditions.

SECTION 096540 - VINYL FLOOR COVERINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Luxury plank vinyl floor coverings.

1.3 SUBMITTALS

- A. Product Data: For each type of product specified.
- B. Samples for Verification: In manufacturer's standard size, but not less than 6-by-9-inch (150-by-230mm) sections of each different color and pattern of plank vinyl floor covering specified, showing the full range of variations expected in these characteristics.
 - 1. For heat-welding bead, manufacturer's standard-size samples, but not less than 9 inches (230 mm) long, of each color specified.
- C. Product Certificates: Signed by manufacturers of plank vinyl floor coverings certifying that each product furnished complies with requirements.
- D. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.
- E. Maintenance Data: For plank vinyl floor coverings to include in the maintenance manuals specified in Division 1.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an installer who is competent in the technique required by manufacturer for heat-welding seams.
- B. Source Limitations: Obtain each type, color, and pattern of plank vinyl floor covering specified from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.

- C. Fire-Test-Response Characteristics: Provide products with the following fire-test-response characteristics as determined by testing identical products per test method indicated below by a testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Critical Radiant Flux: 0.45 W/sq. cm or greater when tested per ASTM E 648.
 - 2. Smoke Density: Maximum specific optical density of 450 or less when tested per ASTM E 662.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver plank vinyl floor coverings and installation accessories to Project site in manufacturer's original, unopened cartons and containers, each bearing names of product and manufacturer, Project identification, and shipping and handling instructions.
- B. Store products in dry spaces protected from the weather, with ambient temperatures maintained between 50 and 90 deg F (10 and 32 deg C). C. Store rolls upright.
- D. Move plank strip vinyl floor coverings and installation accessories into spaces where they will be installed at least 48 hours before installation, unless longer conditioning periods are recommended in writing by manufacturer.

1.6 PROJECT CONDITIONS

- A. Maintain a temperature of not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C) in spaces to receive plank vinyl floor coverings for at least 48 hours before installation, during installation, and for at least 48 hours after installation, unless manufacturer's written recommendations specify longer time periods. After postinstallation period, maintain a temperature of not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).
- B. Do not install plank vinyl floor coverings until they are at the same temperature as the space where they are to be installed.
- C. Close spaces to traffic during plank vinyl floor covering installation and for time period after installation recommended in writing by manufacturer.
- D. Install plank vinyl floor coverings and accessories after other finishing operations, including painting, have been completed.
- E. Do not install plank vinyl floor coverings over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive, as determined by floor covering manufacturer's recommended bond and moisture test.

1.7 EXTRA MATERIALS

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

- 1. Furnish not less than 10 linear feet (3 linear m) in roll form for each 500 linear feet (150 linear m) or fraction thereof, of each different composition, wearing surface, color, and pattern of plank vinyl floor covering installed.
- 2. Deliver extra materials to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide products indicated on the Finish Schedule.

2.2 PLANK VINYL FLOOR COVERING

A. Plank Vinyl Floor Coverings with Backing: Products complying with ASTM F 1303 and with requirements specified in the Finish Schedule

2.3 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based formulation provided or approved by floor covering manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit plank vinyl floor covering and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where installation of plank vinyl floor coverings will occur, with Installer present, for compliance with manufacturer's requirements. Verify that substrates and conditions are satisfactory for floor covering installation and comply with requirements specified.
- B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
 - 1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by floor covering manufacturer.
 - 2. Subfloor finishes comply with requirements specified in Division 3 Section "Cast-in-Place Concrete" for slabs receiving resilient flooring.
 - 3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.
 - 4. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Comply with plank vinyl floor covering manufacturer's written installation instructions for preparing substrates indicated to receive plank vinyl floor coverings.
- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.,
- C. Remove coatings, including curing compounds, and other substances that are incompatible with flooring adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- D. Broom and vacuum clean substrates to be covered immediately before installing plank vinyl floor coverings. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.3 INSTALLATION

- A. General: Comply with plank vinyl floor covering manufacturer's written installation instructions.
- B. Unroll sheet vinyl floor coverings and allow them to stabilize before cutting and fitting, if recommended in writing by manufacturer.
- C. Lay out plank vinyl floor coverings to comply with the following requirements:
 - 1. Maintain uniformity of plank vinyl floor covering direction.
 - 2. Arrange for a minimum number of seams and place them in inconspicuous and low-traffic areas, and not less than 6 inches (150 mm) away from parallel joints in flooring substrates.
 - 3. Match edges of sheet vinyl floor coverings for color shading and pattern at seams according to manufacturer's written recommendations.
 - 4. Avoid cross seams.
- D. Scribe, cut, and fit plank vinyl floor coverings to butt neatly and tightly to vertical surfaces and permanent fixtures, including built-in furniture, cabinets, pipes, outlets, edgings, door frames, thresholds, and nosings. E. Extend plank vinyl floor coverings into toe spaces, door reveals, closets, and similar openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other nonpermanent, nonstaining marking device.
- G. Install plank vinyl floor coverings on covers for telephone and electrical ducts, and similar items in finished floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed on covers. Tightly adhere edges to perimeter of floor around covers and to covers.

- H. Adhere plank vinyl floor coverings to flooring substrates to comply with floor covering manufacturer's written instructions, including those for trowel notching, adhesive mixing, and adhesive open and working times.
 - 1. Produce completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
- I. Chemical Bond Seams: Bond/seal seams with product and method recommended by the floor covering manufacturer for chemically bonding seams.
- J. Hand roll plank vinyl floor coverings in both directions from center out to embed floor coverings in adhesive and eliminate trapped air. At walls, door casings, and other locations where access by roller is impractical, press floor coverings firmly in place with flat-bladed instrument.

3.4 CLEANING AND PROTECTING

- A. Perform the following operations immediately after installing plank vinyl floor coverings:
 - 1. Remove adhesive and other surface blemishes using cleaner recommended by floor covering manufacturer.
 - 2. Sweep or vacuum floor thoroughly.
 - 3. Do not wash floor covering until after time period recommended by floor covering manufacturer.
 - 4. Damp-mop floor to remove marks and soil.
- B. Protect flooring against mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during the remainder of construction period.
 - 1. Cover plank vinyl floor coverings with undyed, untreated building paper until inspection for Substantial Completion.
 - 2. Do not move heavy and sharp objects directly over plank vinyl floor coverings. Place plywood or hardboard panels over floor coverings and under objects while they are being moved. Slide or roll objects over panels without moving panels.
- C. Clean plank vinyl floor coverings not more than 4 days before dates scheduled for inspections intended to establish date of Substantial Completion in each area of Project. Clean floor coverings according to manufacturer's written recommendations.

SECTION 096813 - TILE CARPETING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes modular carpet tile.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site as part of interior finishes coordination conference.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For carpet tile installation, plans showing the following:
 - 1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
 - 2. Carpet tile type, color, and dye lot.
 - 3. Type of subfloor.
 - 4. Type of installation.
 - 5. Pattern of installation.
 - 6. Pattern type, location, and direction.
 - 7. Pile direction.
 - 8. Type, color, and location of insets and borders.
 - 9. Type, color, and location of edge, transition, and other accessory strips.
 - 10. Transition details to other flooring materials.
- C. Samples: For each exposed product and for each color and texture required.

1.4 IINFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Certified by the International Certified Floorcovering Installers Association at the Commercial II certification level.
- B. Mockups: Before installing carpet tile, build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Approved mockups may become part of the completed Work if undamaged at time of Substantial Completion.

1.7 WARRANTY

- A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CARPET TILE

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. See Finish Schedule.
- B. Color: As indicated on Finish Schedule.
- C. Pattern: As indicated on Finish Schedule.
- D. Applied Treatments:
 - 1. Soil-Resistance Treatment: Manufacturer's standard treatment.
 - 2. Antimicrobial Treatment: Manufacturer's standard treatment that protects carpet tiles as follows:
 - a. Antimicrobial Activity: Not less than 2-mm halo of inhibition for gram-positive bacteria, not less than 1-mm halo of inhibition for gram-negative bacteria, and no fungal growth, according to AATCC 174.

2.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
- B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that comply with flammability requirements for installed carpet tile, and are recommended by carpet tile manufacturer for releasable installation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Concrete Slabs:
 - 1. Moisture Testing: Perform tests so that each test area does not exceed either 200 sq. ft. (18.6 sq. m) or manufacturer's requirement to maintain product installation warranty, and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
 - a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
 - b. Relative Humidity Test: Using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum percent relative humidity level measurement in compliance with Carpet manufacturer's requirements.
 - c. Perform additional moisture tests recommended in writing by adhesive and carpet tile manufacturers. Proceed with installation only after substrates pass testing.

3.2 PREPARATION

- A. General: Comply with CRI's "CRI Carpet Installation Standards" and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile.
- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch (3 mm) wide or wider, and protrusions more than 1/32 inch (0.8 mm) unless more stringent requirements are required by manufacturer's written instructions.
- C. Concrete Substrates: Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by adhesive and carpet tile manufacturers.

D. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.3 INSTALLATION

- A. General: Comply with CRI's "CRI Carpet Installation Standard," Section 18, "Modular Carpet" and with carpet tile manufacturer's written installation instructions.
- B. Installation Method: As recommended in writing by carpet tile manufacturer.
- C. Maintain dye-lot integrity. **Do not mix dye lots in same area**.
- D. Maintain pile-direction patterns indicated on Drawings as recommended in writing by carpet tile manufacturer.
- E. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.
- F. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- G. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on carpet tile as marked on subfloor. Use nonpermanent, nonstaining marking device.
- H. Install pattern parallel to walls and borders.
- I. Access Flooring: Stagger joints of carpet tiles so carpet tile grid is offset from access flooring panel grid. Do not fill seams of access flooring panels with carpet adhesive; keep seams free of adhesive.
- J. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.
SECTION 097200 - WALL COVERINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Vinyl wall covering.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each type of wall covering and for each color, pattern, texture, and finish specified, full width by 36-inch long in size.

1.3 INFORMATIONAL SUBMITTALS

A. Product test reports.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: As determined by testing identical wall coverings applied with identical adhesives to substrates according to test method indicated below by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 50 or less.
 - 2. Fire-Growth Contribution: No flashover and heat and smoke release according to NFPA 265.

2.2 VINYL WALL COVERING

- A. <u>Manufacturers:</u> Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Eykon Design Resources.
 - 2. Koroseal Interior Products, LLC
- B. Description: Provide mildew-resistant products in rolls from same production run.
- C. Colors, Textures, and Patterns: As selected by Architect from manufacturer's full range.

2.3 ACCESSORIES

- A. Adhesive: Mildew-resistant, nonstaining adhesive, for use with specific wall covering and substrate application indicated and as recommended in writing by wall-covering manufacturer.
- B. Primer/Sealer: Mildew resistant, complying with requirements in Section 099123 "Interior Painting" and recommended in writing by primer/sealer and wall-covering manufacturers for intended substrate.
- C. Metal Primer: Interior ferrous metal primer complying with Section 099123 "Interior Painting" and recommended in writing by primer and wall-covering manufacturers for intended substrate.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Comply with manufacturer's written instructions for surface preparation.
- B. Clean substrates of substances that could impair bond of wall covering, including dirt, oil, grease, mold, mildew, and incompatible primers.
- C. Prepare substrates to achieve a smooth, dry, clean, structurally sound surface free of flaking, unsound coatings, cracks, and defects.
 - 1. Moisture Content: Maximum of 5 percent on new plaster, concrete, and concrete masonry units when tested with an electronic moisture meter.
 - 2. Plaster: Allow new plaster to cure. Neutralize areas of high alkalinity. Prime with primer recommended in writing by primer/sealer manufacturer and wall-covering manufacturer.
 - 3. Metals: If not factory primed, clean and apply primer recommended in writing by primer/sealer manufacturer and wall-covering manufacturer.

- 4. Gypsum Board: Prime with primer as recommended in writing by primer/sealer manufacturer and wall-covering manufacturer.
- 5. Painted Surfaces: Treat areas susceptible to pigment bleeding.
- D. Check painted surfaces for pigment bleeding. Sand gloss, semigloss, and eggshell finish with fine sandpaper.
- E. Remove hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.
- F. Acclimatize wall-covering materials by removing them from packaging in the installation areas not less than 24 hours before installation.

3.2 WALL-COVERING INSTALLATION

- A. Comply with wall-covering manufacturers' written installation instructions applicable to products and applications indicated.
- B. Cut wall-covering strips in roll number sequence. Change the roll numbers at partition breaks and corners.
- C. Install strips in same order as cut from roll.
- D. Install wall covering without lifted or curling edges and without visible shrinkage.
- E. Match pattern 72 inches above the finish floor.
- F. Install seams vertical and plumb at least 6 inches from outside corners and 3 inches from inside corners unless a change of pattern or color exists at corner. Horizontal seams are not permitted.
- G. Trim edges and seams for color uniformity, pattern match, and tight closure. Butt seams without overlaps or gaps between strips.
- H. Fully bond wall covering to substrate. Remove air bubbles, wrinkles, blisters, and other defects.
- I. Remove excess adhesive at seams, perimeter edges, and adjacent surfaces.
- J. Reinstall hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.

END OF SECTION 097200

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following interior substrates:
 - 1. Concrete.
 - 2. Cement board.
 - 3. Clay masonry.
 - 4. Concrete masonry units (CMUs).
 - 5. Steel and iron.
 - 6. Galvanized metal.
 - 7. Aluminum (not anodized or otherwise coated).
 - 8. Copper.
 - 9. Stainless steel.
 - 10. Wood.
 - 11. Fiberglass.
 - 12. Plastic.
 - 13. Gypsum board.
 - 14. Plaster.
 - 15. Acoustic panels and tiles.
 - 16. Spray-textured ceilings.
 - 17. Cotton or canvas insulation covering.
 - 18. ASJ insulation covering.
 - 19. Bituminous-coated surfaces.

1.3 DEFINITIONS

- A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. MPI Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- D. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

- E. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- F. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- G. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
 - 2. Indicate VOC content.
- B. Samples for Initial Selection: For each type of topcoat product.
- C. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.
 - 1. Submit Samples on rigid backing, 8 inches (200 mm) square.
 - 2. Apply coats on Samples in steps to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- D. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

1.6 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
 - b. Other Items: Architect will designate items or areas required.
 - 2. Final approval of color selections will be based on mockups.

- a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
- 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
- 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.8 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Sherwin-Williams Paint Company (S-W), Basis for product standard Pittsburgh Paint Company (PPG)
 Benjamin Moore Paint Company (BM)
 Other as indicated on the MPI approved vendors list
- B. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed in the Interior Painting Schedule for the paint category indicated.

2.2 PAINT, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- B. Material Compatibility:

- 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
- 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

C. Colors: As selected by Architect from manufacturer's full range.

2.3 SOURCE QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
 - 1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
 - 2. Testing agency will perform tests for compliance with product requirements.
 - 3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Concrete: 12 percent.
 - 2. Fiber-Cement Board: 12 percent.
 - 3. Masonry (Clay and CMUs): 12 percent.
 - 4. Wood: 15 percent.
 - 5. Gypsum Board: 12 percent.
 - 6. Plaster: 12 percent.
- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Plaster Substrates: Verify that plaster is fully cured.
- E. Spray-Textured Ceiling Substrates: Verify that surfaces are dry.
- F. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.

- G. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.
- F. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer.
 - 1. SSPC-SP 2.
 - 2. SSPC-SP 3.
 - 3. SSPC-SP 7/NACE No. 4.
 - 4. SSPC-SP 11.
- G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- I. Aluminum Substrates: Remove loose surface oxidation.
- J. Wood Substrates:
 - 1. Scrape and clean knots, and apply coat of knot sealer before applying primer.

- 2. Sand surfaces that will be exposed to view, and dust off.
- 3. Prime edges, ends, faces, undersides, and backsides of wood.
- 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
- K. Cotton or Canvas Insulation Covering Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 - 1. Paint the following work where exposed in equipment rooms:
 - a. Equipment, including panelboards.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.
 - d. Pipe hangers and supports.
 - e. Metal conduit.
 - f. Plastic conduit.
 - g. Tanks that do not have factory-applied final finishes.
 - h. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.

- 2. Paint the following work where exposed in occupied spaces:
 - a. Equipment, including panelboards.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.
 - d. Pipe hangers and supports.
 - e. Metal conduit.
 - f. Plastic conduit.
 - g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
 - h. Other items as directed by Architect.
- 3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
 - 1. Contractor shall touch up and restore painted surfaces damaged by testing.
 - 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINTING SCHEDULE

- A. Concrete Substrates, Nontraffic Surfaces:
 - 1. Latex System **MPI INT 3.1A**:
 - a. Prime Coat: Primer, alkali resistant, water based, MPI #3.

1) S-W: Loxon Concrete & Masonry Primer / Sealer, LX02W0050

- b. Prime Coat: Latex, interior, matching topcoat.
- c. Intermediate Coat: Latex, interior, matching topcoat.
- d. Topcoat: Latex, interior, flat (MPI Gloss Level 1), MPI #53.
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
- e. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
- f. Topcoat: Latex, interior (MPI Gloss Level 3), MPI #52.
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
- g. Topcoat: Latex, interior (MPI Gloss Level 4), MPI #43.
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
- h. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5), MPI #54.
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
- i. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees), MPI #114.
 - 1) S-W: ProClassic Waterborne Interior Gloss Enamel, B21W02151 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 2. Latex over Latex Aggregate System MPI INT 3.1B:
 - a. Prime Coat: Textured coating, latex, flat, MPI #42.
 - 1) S-W: UltraCrete Textured Masonry Coating, Medium, A44W00811
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior, flat (MPI Gloss Level 1), MPI #53.
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)

- d. Topcoat: Latex, interior (MPI Gloss Level 2), MPI #44.
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
- e. Topcoat: Latex, interior (MPI Gloss Level 3), MPI #52.
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
- f. Topcoat: Latex, interior (MPI Gloss Level 4), MPI #43.
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
- g. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5), MPI #54.
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
- h. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees), MPI #114.
 - 1) S-W: Pro Industrial DTM Acrylic Gloss, B66W01051 S-W Pro Industrial Acrylic Gloss Coating, B66W00611
- 3. Latex Aggregate System **MPI INT 3.1N**:
 - a. Prime Coat: As recommended in writing by topcoat manufacturer.
 - b. Intermediate Coat: As recommended in writing by topcoat manufacturer.
 - c. Topcoat: Textured coating, latex, nonflat, **MPI #41**.
 - 1) S-W: ConFlex UltraCrete Textured Masonry Coating, CF17W0801 Series
 - d. Topcoat: Textured coating, latex, flat, MPI #42.
 - 1) S-W: Conflex UltraCrete Textured Masonry Coating, CF17W0811 Series
- 4. Institutional Low-Odor/VOC Latex System **MPI INT 3.1M**:
 - a. Prime Coat: Primer sealer, interior, institutional low odor/VOC, MPI #149.

1) S-W ProMar 200 Zero VOC Interior Latex Primer, B28W02600 S-W: Harmony Interior Latex Primer, B11W01500

- b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
- c. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1), MPI #143.

- 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Acrylic Latex Flat, B05W01051 (Odor Reducing, VOC Elimination Technologies)
- d. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 2), MPI #144.
 - S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss EgShel, B09W01051
 S-W: Harmony Interior Acrylic Latex Eg-Shel, B09W01051 (Odor Reducing, VOC Elimination Technologies)
- e. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3, MPI #145.
 - S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951 S-W: PaintShield Microbicidal Paint, EgShel, D12W00051 (This product is not listed in MPI #145 Category at this time. Product has the capability to kill bacteria such as: MRSA, Ecoli, Staph within 2 hours of contact. Product MUST be applied by Brush and Roller application only. Registered with the EPA: No. 64695-1
- f. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 4), MPI #146.
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- g. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5), MPI #147.
 - 1) S-W Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- h. Topcoat: Latex, interior, institutional low odor/VOC, gloss (MPI Gloss Level 6), **MPI #148**.
 - 1) S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 5. High-Performance Architectural Latex System **MPI INT 3.1C**:
 - a. Prime Coat: Primer, alkali resistant, water based, MPI #3.

1) S-W: Loxon Concrete & Masonry Primer / Sealer, LX02W0050

- b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
- c. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 2), MPI #138.
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss Eg-Shel, B41W01951
- d. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 3), **MPI #139**.

- 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951 S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy Eg-Shel, K45W00151
- e. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 4), **MPI #140**.
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- f. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5), MPI #141.
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W1151
 S-W: Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- 6. Water-Based Light Industrial Coating System **MPI INT 3.1L**:
 - a. Prime Coat: Primer, alkali resistant, water based, MPI #3.
 - 1) S-W: Loxon Concrete & Masonry Primer / Sealer, LX02W0050
 - b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
 - c. Topcoat: Light industrial coating, interior, water based (MPI Gloss Level 3), MPI #151.
 - 1) S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Eg-Shel, K45W01151 SW: Pro Industrial DTM Acrylic Eg-Shel, B66W01251
 - d. Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 5) **MPI #153**.
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W01151
 W: Pro Industrial DTM Acrylic Semi-Gloss, B66W01151
 - e. Topcoat: Light industrial coating, interior, water based, gloss (MPI Gloss Level 6), **MPI #154**.
 - 1) S-W: Pro Industrial DTM Acrylic Gloss, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 7. Alkyd System **MPI INT 3.1D**:
 - a. Prime Coat: Primer, alkali resistant, water based[, MPI #3].
 - 1) S-W: Loxon Concrete & Masonry Primer / Sealer, LX02W0050
 - b. Intermediate Coat: Alkyd, interior, matching topcoat.
 - c. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1), MPI #49.

S-

- 1) S-W: Currently does not have a product listed in this category. Contact local SW Rep for product options.
- d. Topcoat: Alkyd, interior (MPI Gloss Level 3), MPI #51.
 - 1) S-W: Currently does not have a product listed in this category. Contact local SW Rep for product options.
- e. Topcoat: Alkyd, interior, semi-gloss (MPI Gloss Level 5), MPI #47.
 - 1) S-W: ProMar 200 Alkyd Semi-Gloss Enamel, B34W02251
- f. Topcoat: Alkyd, interior, gloss (MPI Gloss Level 6), MPI #48.
 - 1) S-W: ProMar 200 Alkyd Gloss, B35W02251 S-W: Protective & Marine Industrial HS Enamel, B54WZ0401
- 8. Concrete Stain System MPI INT 3.1K:
 - a. First Coat: Stain, interior, matching topcoat.
 - b. Topcoat: Stain, interior[, MPI #58.

1) S-W: Currently does not have a product listed in this category. Contact local Sales Rep for product options.

- B. Concrete Substrates, Traffic Surfaces:
 - 1. Latex Floor Enamel System **MPI INT 3.2A**:
 - a. Prime Coat: Floor paint, latex, matching topcoat.
 - b. Intermediate Coat: Floor paint, latex, matching topcoat.
 - c. Topcoat: Floor paint, latex, low gloss (maximum MPI Gloss Level 3), MPI #60.

1) S-W: Protective & Marine ArmorSeal Tread-Plex, B90W111

- 2. Alkyd Floor Enamel System **MPI INT 3.2B**:
 - a. Prime Coat: Floor enamel, alkyd, matching topcoat.
 - b. Intermediate Coat: Floor enamel, alkyd, matching topcoat.
 - c. Topcoat: Floor enamel, alkyd, gloss (MPI Gloss Level 6), MPI #27.

1) S-W: Currently does not have a product listed in this category. Contact local Sales Rep for product options.

- 3. Concrete Stain System MPI INT 3.2E:
 - a. First Coat: Stain, interior, for concrete floors, matching topcoat.
 - b. Topcoat: Stain, interior, for concrete floors, MPI #58.
 - 1) S-W: Currently does not have a product listed in this category. Contact local Sales Rep for product options.

- 4. Water-Based Concrete Floor Sealer System **MPI INT 3.2G**:
 - a. First Coat: Sealer, water based, for concrete floors, matching topcoat.
 - b. Topcoat: Sealer, water based, for concrete floors, MPI #99.
- 5. Solvent-Based Concrete Floor Sealer System MPI INT 3.2F:
 - a. First Coat: Sealer, solvent based, for concrete floors, matching topcoat.
 - b. Topcoat: Sealer, solvent based, for concrete floors, MPI #104.

1) S-W: H&C ClariShield Solvent-Based Gloss Concrete Sealer, 30.10200

- C. Cement Board Substrates:
 - 1. Latex System **MPI INT 3.3A**:
 - a. Prime Coat: Primer, alkali resistant, water based, MPI #3.
 - 1) S-W: Loxon Concrete & Masonry Primer / Sealer, LX02W0050
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior, flat (MPI Gloss Level 1), MPI #53.
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
 - d. Topcoat: Latex, interior (MPI Gloss Level 2), MPI #44.
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
 - e. Topcoat: Latex, interior (MPI Gloss Level 3), MPI #52.
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
 - f. Topcoat: Latex, interior (MPI Gloss Level 4), MPI #43.
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
 - g. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5), MPI #54.
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
 - h. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees), MPI #114.

1) S-W: Pro Industrial DTM Acrylic Gloss, B66W01051 S-W Pro Industrial Acrylic Gloss Coating, B66W00611

- 2. Institutional Low-Odor/VOC Latex System MPI INT 3.3G:
 - a. Prime Coat: Primer sealer, interior, institutional low odor/VOC, MPI #149.

1) S-W ProMar 200 Zero VOC Interior Latex Primer, B28W02600 S-W: Harmony Interior Latex Primer, B11W01500

- b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
- c. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1), MPI #143.
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Acrylic Latex Flat, B05W01051 (Odor Reducing, VOC Elimination Technologies)
- d. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 2), MPI #144.
 - S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss EgShel, B09W01051
 S-W: Harmony Interior Acrylic Latex Eg-Shel, B09W01051 (Odor Reducing, VOC Elimination Technologies)
- e. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3), MPI #145.
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951

S-W: PaintShield Microbicidal Paint, EgShel, D12W00051 (This product is not listed in MPI #145 Category at this time. Product has the capability to kill bacteria such as: MRSA, Ecoli, Staph within 2 hours of contact. Product MUST be applied by Brush and Roller application only. Registered with the EPA: No. 64695-1

- f. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 4), MPI #146.
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- g. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5), MPI #147.
 - 1) S-W Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- h. Topcoat: Latex, interior, institutional low odor/VOC, gloss (MPI Gloss Level 6), **MPI #148**.

1) S-W: Pro Industrial Acrylic Gloss Coating, B66W00611

- 3. High-Performance Architectural Latex System MPI INT 3.3B:
 - a. Prime Coat: Primer, alkali resistant, water based, MPI #3.

1) S-W: Loxon Concrete & Masonry Primer / Sealer, LX02W0050

- b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
- c. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 2), **MPI #138**.

1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss Eg-Shel, B41W01951

d. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 3), **MPI #139**.

1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951 S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy Eg-Shel, K45W00151

- e. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 4), **MPI #140**.
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- f. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5), MPI #141.

1) S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W1151 S-W: Pro Industrial Acrylic Semi-Gloss Coating, B66W00651

- 4. Water-Based Light Industrial Coating System **MPI INT 3.3H**:
 - a. Prime Coat: Primer, alkali resistant, water based, **MPI #3**.
 - 1) S-W: Loxon Concrete & Masonry Primer / Sealer, LX02W0050
 - b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
 - c. Topcoat: Light industrial coating, interior, water based (MPI Gloss Level 3), MPI #151.

S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Eg-Shel, K45W1151 SW: Pro Industrial DTM Acrylic Eg-Shel, B66W01251

d. Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 5), MPI #153.

- 1) S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W01151
- 2) S-W: Pro Industrial DTM Acrylic Semi-Gloss, B66W01151
- e. Topcoat: Light industrial coating, interior, water based, gloss (MPI Gloss Level 6), **MPI #154**.
 - 1) S-W: Pro Industrial DTM Acrylic Gloss, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 5. Alkyd System **MPI INT 3.3C**:
 - a. Prime Coat: Primer, alkali resistant, water based, MPI #3.
 - 1) S-W: Loxon Concrete & Masonry Primer / Sealer, LX02W0050
 - b. Intermediate Coat: Alkyd, interior, matching topcoat.
 - c. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1), MPI #49.
 - 1) S-W: Currently does not have a product listed in this category. Contact local SW Rep for product options.
 - d. Topcoat: Alkyd, interior (MPI Gloss Level 3), MPI #51.
 - 1) S-W: Currently does not have a product listed in this category. Contact local SW Rep for product options.
 - e. Topcoat: Alkyd, interior, semi-gloss (MPI Gloss Level 5), MPI #47.
 - 1) S-W: ProMar 200 Alkyd Semi-Gloss Enamel, B34W00251
 - f. Topcoat: Alkyd, interior, gloss (MPI Gloss Level 6), MPI #48.
 - 1) S-W: ProMar 200 Alkyd Gloss, B35W02251 S-W: Protective & Marine Industrial HS Enamel, B54WZ0401
- D. Clay Masonry Substrates:
 - 1. Latex System MPI INT 4.1A:
 - a. Prime Coat: Primer, alkali resistant, water based, MPI #3.
 - 1) S-W: Loxon Concrete & Masonry Primer / Sealer, LX02W0050
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior, flat (MPI Gloss Level 1), **MPI #53**.
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)

- d. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
- e. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
- f. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
- g. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
- h. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss, B66W01051 S-W Pro Industrial Acrylic Gloss Coating, B66W00611
- 2. Latex Aggregate System [MPI INT 4.1B]:
 - a. Prime Coat: Primer for textured coating, latex, flat[, as recommended in writing by topcoat manufacturer].
 - b. Intermediate Coat: Intermediate coat for textured coating, latex, flat[, as recommended in writing by topcoat manufacturer].
 - c. Topcoat: Textured coating, latex, nonflat[, MPI #41].
 - 1) S-W: ConFlex UltraCrete Textured Masonry Coating, CF17W0801
 - d. Topcoat: Textured coating, latex, flat[, MPI #42].
 - 1) S-W: ConFlex UltraCrete Textured Masonry Coating, CF17W0811
- 3. Institutional Low-Odor/VOC Latex System [MPI INT 4.1M]:
 - a. Prime Coat: Primer sealer, interior, institutional low odor/VOC[, MPI #149].

1) S-W ProMar 200 Zero VOC Interior Latex Primer, B28W02600 S-W: Harmony Interior Latex Primer, B11W01500

- b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
- c. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1)[, **MPI #143**].

- 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Acrylic Latex Flat, B05W01051 (Odor Reducing, VOC Elimination Technologies)
- d. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 2)[, MPI #144].
 - S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss EgShel, B09W01051
 S-W: Harmony Interior Acrylic Latex Eg-Shel, B09W01051 (Odor Reducing, VOC Elimination Technologies)
- e. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3)[, MPI #145].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951

S-W: PaintShield Microbicidal Paint, EgShel, D12W00051 (This product is not listed in MPI #145 Category at this time. Product has the capability to kill bacteria such as: MRSA, Ecoli, Staph within 2 hours of contact. Product MUST be applied by Brush and Roller application only. Registered with the EPA: No. 64695-1

- f. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 4)[, MPI #146].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- g. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5)[, MPI #147].
 - 1) S-W Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- h. Topcoat: Latex, interior, institutional low odor/VOC, gloss (MPI Gloss Level 6)[, MPI #148].
 - 1) S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 4. High-Performance Architectural Latex System [MPI INT 4.1L]:
 - a. Prime Coat: Primer, alkali resistant, water based[, MPI #3].

1) S-W: Loxon Concrete & Masonry Primer / Sealer, LX02W0050

- b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
- c. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 2)[, MPI #138].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss Eg-Shel, B41W01951

- d. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 3)[, MPI #139].
 - S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951 S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy Eg-Shel, K45W01151
- e. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 4)[, MPI #140].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- f. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5)[, **MPI #141**].
 - 1) S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W1151 S-W: Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- 5. Water-Based Light Industrial Coating System [MPI INT 4.1C]:
 - a. Prime Coat: Primer, alkali resistant, water based[, MPI #3].
 - 1) S-W: Loxon Concrete & Masonry Primer / Sealer, LX02W0050
 - b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
 - c. Topcoat: Light industrial coating, interior, water based (MPI Gloss Level 3)[, MPI #151].
 - 1) S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Eg-Shel, K45W1151 SW: Pro Industrial DTM Acrylic Eg-Shel, B66W01251
 - d. Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 5)[, MPI #153].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W01151
 S-W: Pro Industrial DTM Acrylic Semi-Gloss, B66W01151
 - e. Topcoat: Light industrial coating, interior, water based, gloss (MPI Gloss Level 6)[, **MPI #154**].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 6. Alkyd System [**MPI INT 4.1D**]:
 - a. Prime Coat: Primer, alkali resistant, water based[, MPI #3].
 - 1) S-W: Loxon Concrete & Masonry Primer / Sealer, LX02W0050

- b. Intermediate Coat: Alkyd, interior, matching topcoat.
- c. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1)[, MPI #49].
 - 1) S-W: Currently does not have a product listed in this category. Contact local SW Rep for product options.
- d. Topcoat: Alkyd, interior (MPI Gloss Level 3)[, MPI #51].
 - 1) S-W: Currently does not have a product listed in this category. Contact local SW Rep for product options.
- e. Topcoat: Alkyd, interior, semi-gloss (MPI Gloss Level 5)[, MPI #47].
 - 1) S-W: ProMar 200 Alkyd Semi-Gloss Enamel, B34W00251
- f. Topcoat: Alkyd, interior, gloss (MPI Gloss Level 6)[, MPI #48].
 - 1) S-W: ProMar 200 Alkyd Gloss, B35W02251 S-W: Protective & Marine Industrial HS Enamel, B54WZ0401
- 7. Clear (2-Component) Polyurethane System [MPI INT 4.1K]:
 - a. Prime Coat: Two-component polyurethane matching topcoat.
 - b. Intermediate Coat: Two-component polyurethane matching topcoat.
 - c. Topcoat: Varnish, aliphatic polyurethane, two-component (MPI Gloss Level 6 or MPI Gloss Level 7)[, MPI #78].
 - 1) S-W: Currently does not have a product in this category. Contact local SW Rep for product option.
- E. CMU Substrates:
 - 1. Latex System [MPI INT 4.2A]:
 - a. Block Filler: Block filler, latex, interior/exterior[, MPI #4].
 - S-W: PrepRite Interior / Exterior Block Filler, B25W25 (Dry Area, Acrylic Topcoats
 S-W: Pro Industrial Heavy Duty Block Filler, B42W151 (High Moisture Areas, High Performance Topcoats)
 S-W: Loxon Acrylic Block Surfacer, LX01W0200 (High PH conditions, High Performance Topcoats)
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
 - d. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].

- 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
- e. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
- f. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
- g. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
- h. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].

1) S-W: Pro Industrial DTM Acrylic Coating, B66W01051 S-W Pro Industrial Acrylic Gloss Coating, B66W00611

- 2. Latex Aggregate System [MPI INT 4.2B]:
 - a. Prime Coat: Primer for textured coating, latex, flat[, as recommended in writing by topcoat manufacturer].
 - b. Intermediate Coat: Intermediate coat for textured coating, latex, flat[, as recommended in writing by topcoat manufacturer].
 - c. Topcoat: Textured coating, latex, nonflat[, MPI #41].
 - 1) S-W: Conflex UltraCrete Textured Masonry Coating, CF17W0801
 - d. Topcoat: Textured coating, latex, flat[, MPI #42].
 - 1) S-W: Conflex UltraCrete Textured Masonry Coating, CF17W0811
- 3. Institutional Low-Odor/VOC Latex System [MPI INT 4.2E]:
 - a. Block Filler: Block filler, latex, interior/exterior[, MPI #4].
 - S-W: PrepRite Interior / Exterior Block Filler, B25W25 (Dry Area, Acrylic Topcoats
 S-W: Pro Industrial Heavy Duty Block Filler, B42W151 (High Moisture Areas, High Performance Topcoats)
 S-W: Loxon Acrylic Block Surfacer, LX01W0200 (High PH conditions, High Performance Topcoats)
 - b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.

- c. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1)[, MPI #143].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Acrylic Latex Flat, B05W01051 (Odor Reducing, VOC Elimination Technologies)
- d. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 2)[, MPI #144].
 - S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss EgShel, B09W01051
 S-W: Harmony Interior Acrylic Latex Eg-Shel, B09W01051 (Odor Reducing, VOC Elimination Technologies)
- e. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3)[, MPI #145].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951

S-W: PaintShield Microbicidal Paint, EgShel, D12W00051 (This product is not listed in MPI #145 Category at this time. Product has the capability to kill bacteria such as: MRSA, Ecoli, Staph within 2 hours of contact. Product MUST be applied by Brush and Roller application only. Registered with the EPA: No. 64695-1

- f. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 4)[, MPI #146].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- g. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5)[, MPI #147].
 - 1) S-W Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- h. Topcoat: Latex, interior, institutional low odor/VOC, gloss (MPI Gloss Level 6)[, **MPI #148**].
 - 1) S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 4. High-Performance Architectural Latex System [MPI INT 4.2D] [MPI INT 4.2P]:
 - a. Block Filler: Block filler, latex, interior/exterior[, MPI #4].
 - S-W: PrepRite Interior / Exterior Block Filler, B25W25 (Dry Area, Acrylic Topcoats
 S-W: Pro Industrial Heavy Duty Block Filler, B42W151 (High Moisture Areas, High Performance Topcoats)

S-W: Loxon Acrylic Block Surfacer, LX01W0200 (High PH conditions, High Performance Topcoats)

- b. Prime Coat: Primer, alkali resistant, water based[, MPI #3].
 - 1) S-W: Loxon Concrete & Masonry Primer / Sealer, LX02W0050
- c. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
- d. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 2)[, MPI #138].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss Eg-Shel, B41W01951
- e. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 3)[, MPI #139].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951 S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy Eg-Shel, K45W01151
- f. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 4)[, MPI #140].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- g. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5)[, MPI #141].
 - 1) S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W1151 S-W: Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- 5. Water-Based Light Industrial Coating System [MPI INT 4.2K]:
 - a. Block Filler: Block filler, latex, interior/exterior[, MPI #4].
 - S-W: PrepRite Interior / Exterior Block Filler, B25W25 (Dry Area, Acrylic Topcoats
 S-W: Pro Industrial Heavy Duty Block Filler, B42W151 (High Moisture Areas, High Performance Topcoats)
 S-W: Loxon Acrylic Block Surfacer, LX01W0200 (High PH conditions, High Performance Topcoats)
 - b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
 - c. Topcoat: Light industrial coating, interior, water based (MPI Gloss Level 3)[, MPI #151].

- 1) S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Eg-Shel, K45W1151 SW: Pro Industrial DTM Acrylic Eg-Shel, B66W01251
- d. Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 5)[, MPI #153].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W01151
 S-W: Pro Industrial DTM Acrylic Semi-Gloss, B66W01151
- e. Topcoat: Light industrial coating, interior, water based, gloss (MPI Gloss Level 6)[, **MPI #154**].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 6. Alkyd System [**MPI INT 4.2C**] [**MPI INT 4.2N**]:
 - a. Block Filler: Block filler, latex, interior/exterior[, MPI #4].
 - S-W: PrepRite Interior / Exterior Block Filler, B25W25 (Dry Area, Acrylic Topcoats
 S-W: Pro Industrial Heavy Duty Block Filler, B42W151 (High Moisture Areas, High Performance Topcoats)
 S-W: Loxon Acrylic Block Surfacer, LX01W0200 (High PH conditions, High Performance Topcoats)
 - b. Sealer Coat: Primer sealer, latex, interior[, MPI #50].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Primer, B28W02600 S-W: Harmony Interior Latex Primer, B11W01500
 - c. Intermediate Coat: Alkyd, interior, matching topcoat.
 - d. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1)[, MPI #49].
 - 1) S-W: Currently does not have a product listed in this category. Contact local SW Rep for product options.
 - e. Topcoat: Alkyd, interior (MPI Gloss Level 3)[, MPI #51].
 - 1) S-W: Currently does not have a product listed in this category. Contact local SW Rep for product options.
 - f. Topcoat: Alkyd, interior, semi-gloss (MPI Gloss Level 5)[, MPI #47].
 - 1) S-W: ProMar 200 Alkyd Semi-Gloss Enamel, B34W00251
 - g. Topcoat: Alkyd, interior, gloss (MPI Gloss Level 6)[, MPI #48].
 - 1) S-W: ProMar 200 Alkyd Gloss, B35W02251 S-W: Protective & Marine Industrial HS Enamel, B54WZ0401

- 7. Clear (2-Component) Polyurethane System [MPI INT 4.2Q]:
 - a. Prime Coat: Two-component polyurethane, matching topcoat.
 - b. Intermediate Coat: Two-component polyurethane, matching topcoat.
 - c. Topcoat: Varnish, aliphatic polyurethane, two component (MPI Gloss Level 6 or MPI Gloss Level 7)[, MPI #78].
 - 1) S-W: Currently does not have product listed in this category. Contact local Sales Rep for possible product options.
- F. Steel Substrates:
 - 1. Latex System, Alkyd Primer [MPI INT 5.1Q] [MPI INT 5.1QQ]:
 - a. Prime Coat: Primer, alkyd, quick dry, for metal[, MPI #76].
 - 1) S-W: Protective & Marine Kem Bond HS Universal Alkyd Primer, B50WZ0004
 - b. Prime Coat: Primer, alkyd, anti-corrosive, for metal[, MPI #79].

1) S-W: Protective & Marine Kem Kromik Universal Primer, B50WZ1 S-W: Kem Bond HS Primer, B50WZ4

- c. Prime Coat: Shop primer specified in Section where substrate is specified.
- d. Intermediate Coat: Latex, interior, matching topcoat.
- e. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
- f. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
- g. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
- h. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
- i. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)

- j. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W Pro Industrial Acrylic Gloss Coating, B66W00611
- 2. Latex over Shop-Applied Quick-Drying Shop Primer System [MPI INT 5.1X]:
 - a. Prime Coat: Primer, quick dry, for shop application[, MPI #275].
 - 1) S-W: Kem-Flash 500 Primer, E61A00750
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
 - d. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
 - e. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
 - f. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
 - g. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
 - h. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W Pro Industrial Acrylic Gloss Coating, B66W00611
- 3. Institutional Low-Odor/VOC Latex System [MPI INT 5.1S]:
 - a. Prime Coat: Primer, rust inhibitive, water based[MPI #107].
 - 1) S-W: Pro Industrial Pro-Cryl Universal Primer, B66W01310

- b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
- c. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1)[, MPI #143].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Acrylic Latex Flat, B05W01051 (Odor Reducing, VOC Elimination Technologies)
- d. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 2)[, MPI #144].
 - S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss EgShel, B09W01051
 S-W: Harmony Interior Acrylic Latex Eg-Shel, B09W01051(Odor Reducing, VOC Elimination Technologies)
- e. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3)[, MPI #145].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951

S-W: PaintShield Microbicidal Paint, EgShel, D12W00051 (This product is not listed in MPI #145 Category at this time. Product has the capability to kill bacteria such as: MRSA, Ecoli, Staph within 2 hours of contact. Product MUST be applied by Brush and Roller application only. Registered with the EPA: No. 64695-1

- f. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 4)[, MPI #146].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- g. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5)[, MPI #147].
 - 1) S-W Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- h. Topcoat: Latex, interior, institutional low odor/VOC, gloss (MPI Gloss Level 6)[, **MPI #148**].
 - 1) S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 4. High-Performance Architectural Latex System [MPI INT 5.1R] [MPI INT 5.1RR]:
 - a. Prime Coat: Primer, alkyd, quick dry, for metal[, **MPI #76**].
 - 1) S-W: Protective & Marine Kem Bond HS Universal Alkyd Primer, B50WZ0004
 - b. Prime Coat: Primer, alkyd, anti-corrosive, for metal[, MPI #79].

1) S-W: Protective & Marine Kem Kromik Universal Primer, B50WZ1 S-W: Kem Bond HS Primer, B50WZ4

- c. Prime Coat: Shop primer specified in Section where substrate is specified.
- d. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
- e. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 2)[, MPI #138].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss Eg-Shel, B41W01951
- f. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 3)[, MPI #139].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951 S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy Eg-Shel, K45W00151
- g. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 4)[, MPI #140].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- h. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5)[, MPI #141].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W1151
 S-W: Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- 5. Water-Based Light Industrial Coating System [MPI INT 5.1B]:
 - a. Prime Coat: Primer, rust-inhibitive, water based[MPI #107].
 - 1) S-W: Pro Industrial Pro-Cryl Universal Primer, B66W01310
 - b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
 - c. Topcoat: Light industrial coating, interior, water based (MPI Gloss Level 3)[, MPI #151].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Eg-Shel, K45W1151
 SW: Pro Industrial DTM Acrylic Eg-Shel, B66W01251
 - d. Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 5)[, MPI #153].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W01151
 S-W: Pro Industrial DTM Acrylic Semi-Gloss, B66W01151

- e. Topcoat: Light industrial coating, interior, water based, gloss (MPI Gloss Level 6)[, **MPI #154**].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 6. Water-Based Light Industrial Coating System over Epoxy Primer System [MPI INT 5.1N]:
 - a. Prime Coat: Primer, epoxy, anti-corrosive[MPI #101].
 - 1) S-W: Protective & Marine Dura-Plate 235 Multi-Purpose Epoxy, B67W235/B67V235
 - b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
 - c. Topcoat: Light industrial coating, interior, water based (MPI Gloss Level 3)[, MPI #151].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Eg-Shel, K45W151
 SW: Pro Industrial DTM Acrylic Eg-Shel, B66W01251
 - d. Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 5)[, MPI #153].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W00151
 S-W: Pro Industrial DTM Acrylic Semi-Gloss, B66W01151
 - e. Topcoat: Light industrial coating, interior, water based, gloss (MPI Gloss Level 6)[, **MPI #154**].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 7. Water-Based Dry-Fall System [MPI INT 5.1C] [MPI INT 5.1CC]:
 - a. Prime Coat: Primer, alkyd, quick dry, for metal[, MPI #76].
 - 1) S-W: Protective & Marine Kem Bond HS Universal Alkyd Primer, B50WZ0004
 - b. Prime Coat: Primer, alkyd, anti-corrosive, for metal[, MPI #79].

1) S-W: Protective & Marine Kem Kromik Universal Primer, B50WZ1 S-W: Kem Bond HS Primer, B50WZ4

- c. Prime Coat: Shop primer specified in Section where substrate is specified.
- d. Topcoat: Dry fall, latex, flat[, MPI #118].
 - 1) S-W: Protective & Marine Waterborne Acrylic Dryfall, B42W1 S-W: Pro Industrial Waterborne Acrylic Dryfall, B42W00181

- e. Topcoat: Dry fall, water based, for galvanized steel, flat (MPI Gloss Level 1)[, MPI #133].
 - 1) S-W: Currently does not have a product listed in this category. Contact local SW Sales Rep for product options.
- f. Topcoat: Dry fall, latex (MPI Gloss Level 3)[, MPI #155].
 - 1) S-W: Protective & Marine Dry Fall Flat, B48W00060 S-W: Industrial & Marine Super Save-lite Dry Fall, B48W61
- g. Topcoat: Dry fall, latex (MPI Gloss Level 5)[, MPI #226].
 - S-W: Pro Industrial Waterborne Acrylic Dryfall Semi-Gloss, B42W83 S-W: Protective & Marine Spraylastic Interior / Exterior Waterborne Dryfall, B42W17
- 8. Water-Based Dry-Fall over Shop-Applied Quick-Drying Shop Primer System [MPI INT 5.1CCC]:
 - a. Prime Coat: Primer, quick dry, for shop application[, MPI #275].
 - 1) S-W: Chemical Coatings Kem-Flash 500 Primer, E61A00750
 - b. Topcoat: Dry fall, latex, flat[, MPI #118].
 - 1) S-W: Protective & Marine Waterborne Acrylic Dryfall, B42W1 S-W: Pro Industrial Waterborne Acrylic Dryfall, B42W00181
 - c. Topcoat: Dry fall, water based, for galvanized steel, flat (MPI Gloss Level 1)[, **MPI #133**].
 - 1) S-W: Currently does not have a product listed in this category. Contact local SW Sales Rep for product options.
 - d. Topcoat: Dry fall, latex (MPI Gloss Level 3)[, MPI #155].
 - 1) S-W: Waterborne Acrylic Dryfall, Eg-Shel, B42W0002 S-W: Pro Industrial Multi-Surface Acrylic Coating, B66W01561
 - e. Topcoat: Dry fall, latex (MPI Gloss Level 5)[, MPI #226].
 - S-W: Pro Industrial Waterborne Acrylic Dryfall Semi-Gloss, B42W83 S-W: Protective & Marine Spraylastic Interior / Exterior Waterborne Dryfall, B42W17
- 9. Alkyd System [**MPI INT 5.1E**] [**MPI INT 5.1EE**]:
 - a. Prime Coat: Primer, alkyd, quick dry, for metal[, MPI #76].
 - 1) S-W: Protective & Marine Kem Bond HS Universal Alkyd Primer, B50WZ0004

b. Prime Coat: Primer, alkyd, anti-corrosive, for metal[, MPI #79].

1) S-W: Protective & Marine Kem Kromik Universal Primer, B50WZ1 S-W: Kem Bond HS Primer, B50WZ4

- c. Prime Coat: Shop primer specified in Section where substrate is specified.
- d. Intermediate Coat: Alkyd, interior, matching topcoat.
- e. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1)[, MPI #49].
 - 1) S-W: Currently does not have a product listed in this category. Contact local SW Rep for product options.
- f. Topcoat: Alkyd, interior (MPI Gloss Level 3)[, MPI #51].
 - 1) S-W: Currently does not have a product listed in this category. Contact local SW Rep for product options.
- g. Topcoat: Alkyd, interior, semi-gloss (MPI Gloss Level 5)[, MPI #47].
 - 1) S-W: ProMar 200 Alkyd Semi-Gloss Enamel, B34W00251
- h. Topcoat: Alkyd, interior, gloss (MPI Gloss Level 6)[, MPI #48].
 - 1) S-W: Pro Mar 200 Alkyd Gloss, B35W2251 S-W: Protective & Marine Industrial Enamel HS, B54WZ0401
- 10. Alkyd over Surface-Tolerant Primer System [MPI INT 5.1T]:
 - a. Prime Coat: Primer, metal, surface tolerant[MPI #23].
 - 1) S-W: Protective & Marine Kem Kromik Universal Primer, B50WZ1 S-W: Protective & Marine Kem Bond HS Primer, B50WZ4
 - b. Intermediate Coat: Alkyd, interior, matching topcoat.
 - c. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1)[, MPI #49].
 - 1) S-W: Currently does not have a product listed in this category. Contact local SW Rep for product options.
 - d. Topcoat: Alkyd, interior (MPI Gloss Level 3)[, MPI #51].
 - 1) S-W: Currently does not have a product listed in this category. Contact local SW Rep for product options.
 - e. Topcoat: Alkyd, interior, semi-gloss (MPI Gloss Level 5)[, MPI #47].
 - 1) S-W: ProMar 200 Alkyd Semi-Gloss Enamel, B34W00251

Topcoat: Alkyd, interior, gloss (MPI Gloss Level 6)[, MPI #48].

1) S-W: ProMar 200 Alkyd Gloss, B35W02251 S-W: Protective & Marine Industrial HS Enamel, B54WZ0401

- 11. Alkyd over Shop-Applied Quick-Drying Shop Primer System [MPI INT 5.1W]:
 - a. Prime Coat: Primer, quick dry, for shop application[, MPI #275].

1) S-W: Chemical Coatings Kem-Flash 500 Primer, E61A00750

- b. Intermediate Coat: Alkyd, interior, matching topcoat.
- c. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1)[, MPI #49].
 - 1) S-W: Currently does not have a product listed in this category. Contact local SW Rep for product options.
- d. Topcoat: Alkyd, interior (MPI Gloss Level 3)[, MPI #51].
 - 1) S-W: Currently does not have a product listed in this category. Contact local SW Rep for product options.
- e. Topcoat: Alkyd, interior, semi-gloss (MPI Gloss Level 5)[, MPI #47].
 - 1) S-W: ProMar 200 Alkyd Semi-Gloss Enamel, B34W00251
- f. Topcoat: Alkyd, interior, gloss (MPI Gloss Level 6)[, MPI #48].
 - 1) S-W: ProMar 200 Alkyd Gloss, B35W02251 S-W: Protective & Marine Industrial HS Enamel, B54WZ0401
- 12. Quick-Dry Enamel System [MPI INT 5.1A]:
 - a. Prime Coat: Primer, alkyd, quick dry, for metal[, **MPI #76**].
 - 1) S-W: Protective & Marine Kem Bond HS Universal Alkyd Primer, B50WZ0004
 - b. Intermediate Coat: Alkyd, quick dry, matching topcoat.
 - c. Topcoat: Alkyd, quick dry, semi-gloss (MPI Gloss Level 5)[, MPI #81].
 - 1) S-W: Protective & Marine Direct-to-Metal, B55W101
 - d. Topcoat: Alkyd, quick dry, gloss (MPI Gloss Level 7)[, MPI #96].
 - 1) S-W: Product Finishes Sher-Kem High Gloss Metal Finishing Enamel, F75WC7
- 13. Alkyd Dry-Fall System [MPI INT 5.1D] [MPI INT 5.1DD]:
 - a. Prime Coat: Primer, alkyd, quick dry, for metal[, MPI #76].
 - 1) S-W: Protective & Marine Kem Bond HS Universal Alkyd Primer, B50WZ0004
 - b. Prime Coat: Primer, alkyd, anti-corrosive, for metal[, MPI #79].

1) S-W: Protective & Marine Kem Kromik Universal Primer, B50WZ1 S-W: Kem Bond HS Primer, B50WZ4

- c. Prime Coat: Shop primer specified in Section where substrate is specified.
- d. Topcoat: Dry fall, alkyd, flat[, MPI #55].

1) S-W: Protective & Marine Dry Fall Flat, B48W00060 S-W: Industrial & Marine Super Save-lite Dry Fall, B48W61

- e. Topcoat: Dry fall, alkyd (MPI Gloss Level 3)[, MPI #89].
 - 1) S-W: Industrial & Marine Super Save-lite Dry Fall, B47W62
- f. Topcoat: Dry fall, alkyd, semi-gloss (MPI Gloss Level 5)[, MPI #225].
 - 1) S-W: Currently does not have a product in this category. Contact your local rep for possible product options.
- 14. Alkyd Dry-Fall over Quick-Drying Primer System [MPI INT 5.1ZZ]:
 - a. Prime Coat: Primer, quick dry, for shop application[, MPI #275].
 - 1) S-W: Chemical Coatings Kem-Flash 500 Primer, E61A00750
 - b. Topcoat: Dry fall, alkyd, flat[, MPI #55].
 - 1) S-W: Protective & Marine Dry Fall Flat, B48W00060 S-W: Industrial & Marine Super Save-lite Dry Fall, B48W61
 - c. Topcoat: Dry fall, alkyd (MPI Gloss Level 3)[, MPI #89].
 - 1) S-W: Industrial & Marine Super Save-lite Dry Fall, B47W62
 - d. Topcoat: Dry fall, alkyd, semi-gloss (MPI Gloss Level 5)[, MPI #225].
 - 1) S-W: Currently does not have a product in this category. Contact your local rep for possible product options.
- 15. Aluminum Paint System [MPI INT 5.1M] [MPI INT 5.1MM]:
 - a. Prime Coat: Primer, alkyd, quick dry, for metal[, MPI #76].

1) S-W: Protective & Marine Kem Bond HS Universal Alkyd Primer, B50WZ0004

b. Prime Coat: Primer, alkyd, anti-corrosive, for metal[, MPI #79].

1) S-W: Protective & Marine Kem Kromik Universal Primer, B50WZ1 S-W: Kem Bond HS Primer, B50WZ4

- c. Prime Coat: Shop primer specified in Section where substrate is specified.
- d. Intermediate Coat: Aluminum paint, matching topcoat.
- e. Topcoat: Aluminum paint[, MPI #1].
 - 1) S-W: Protective & Marine Silver-Brite Aluminum, B59S11 S-W: Protective & Marine Industrial Aluminum Paint, B59S4
- G. Galvanized-Metal Substrates:
 - 1. Latex System [MPI INT 5.3A] [MPI INT 5.3J]:
 - a. Prime Coat: Primer, galvanized, cementitious[, MPI #26].
 - 1) S-W: Currently does not have a product in this category. Contact your local rep for possible product options.
 - b. Prime Coat: Primer, galvanized, water based[, MPI #134].
 - 1) S-W: Pro Industrial DTM Primer / Finish, B66W00011 S-W: Pro Industrial Pro-Cryl Universal Primer, B66W1310
 - c. Intermediate Coat: Latex, interior, matching topcoat.
 - d. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
 - e. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
 - f. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
 - g. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
 - h. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
 - i. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W Pro Industrial Acrylic Gloss Coating, B66W00611

- 2. Institutional Low-Odor/VOC Latex System [MPI INT 5.3N]:
 - a. Prime Coat: Primer, galvanized, water based[, MPI #134].

1) S-W: Pro Industrial DTM Primer / Finish, B66W00011 S-W: Pro Industrial Pro-Cryl Universal Primer, B66W1310

- b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
- c. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1)[, MPI #143].

1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Acrylic Latex Flat, B05W01051 (Odor Reducing, VOC Elimination Technologies)

- d. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 2)[, MPI #144].
 - S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss EgShel, B09W01051
 S-W: Harmony Interior Acrylic Latex Eg-Shel, B09W01051 (Odor Reducing, VOC Elimination Technologies)
- e. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3)[, MPI #145].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951

S-W: PaintShield Microbicidal Paint, EgShel, D12W00051 (This product is not listed in MPI #145 Category at this time. Product has the capability to kill bacteria such as: MRSA, Ecoli, Staph within 2 hours of contact. Product MUST be applied by Brush and Roller application only. Registered with the EPA: No. 64695-1

- f. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 4)[, MPI #146].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- g. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5)[, MPI #147].
 - 1) S-W: Pro Industrial Acrylic Semi-Gloss coating, B66W00651
- h. Topcoat: Latex, interior, institutional low odor/VOC, gloss (MPI Gloss Level 6)[, **MPI #148**].
 - 1) S-W Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- 3. High-Performance Architectural Latex System [MPI INT 5.3M]:

a. Prime Coat: Primer, galvanized, water based[, MPI #134].

1) S-W: Pro Industrial DTM Primer / Finish, B66W00011 S-W: Pro Industrial Pro-Cryl Universal Primer, B66W1310

- b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
- c. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 2)[, MPI #138].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss Eg-Shel, B41W01951
- d. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 3)[, MPI #139].
 - S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951 S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy Eg-Shel, K45W01151
- e. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 4)[, MPI #140].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- f. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5)[, MPI #141].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W1151
 S-W: Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- 4. Water-Based Light Industrial Coating System [MPI INT 5.3B] [MPI INT 5.3K]:
 - a. Prime Coat: Primer, galvanized, cementitious[, MPI #26].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - b. Prime Coat: Primer, galvanized, water based[, MPI #134].

1) S-W: Pro Industrial DTM Primer / Finish, B66W00011 S-W: Pro Industrial Pro-Cryl Universal Primer, B66W1310

- c. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
- d. Topcoat: Light industrial coating, interior, water based (MPI Gloss Level 3)[, MPI #151].
 - 1) S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Eg-Shel, K45W1151 SW: Pro Industrial DTM Acrylic Eg-Shel, B66W01251

- e. Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 5)[, MPI #153].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W01151
 S-W: Pro Industrial DTM Acrylic Semi-Gloss, B66W01151
- f. Topcoat: Light industrial coating, interior, water based, gloss (MPI Gloss Level 6)[, **MPI #154**].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 5. Water-Based Dry-Fall System [MPI INT 5.3H]:
 - a. Prime Coat: Dry fall, water based, for galvanized steel, matching topcoat.
 - b. Topcoat: Dry fall, water based, for galvanized steel, flat (MPI Gloss Level 1)[, **MPI #133**].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
- 6. Alkyd over Cementitious Primer System [**MPI INT 5.3C**]:
 - a. Prime Coat: Primer, galvanized, cementitious[, MPI #26].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - b. Intermediate Coat: Alkyd, interior, matching topcoat.
 - c. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1)[, MPI #49].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - d. Topcoat: Alkyd, interior (MPI Gloss Level 3)[, MPI #51].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - e. Topcoat: Alkyd, interior, semi-gloss (MPI Gloss Level 5)[, MPI #47].
 - 1) S-W: ProMar 200 Alkyd Semi-Gloss Enamel, B34W02251
 - f. Topcoat: Alkyd, interior, gloss (MPI Gloss Level 6)[, MPI #48].
 - 1) S-W: ProMar 200 Alkyd Gloss, B35W02251 S-W: Protective & Marine Industrial HS Enamel, B54WZ0401
- 7. Alkyd Dry-Fall System (Cementitious Primer) [MPI INT 5.3F]:
 - a. Prime Coat: Primer, galvanized, cementitious[, MPI #26].

- 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
- b. Topcoat: Dry fall, alkyd, flat[, **MPI #55**].
 - 1) S-W: Protective & Marine Dry Fall Flat, B48W00060 S-W: Industrial & Marine Super Save-lite Dry Fall, B48W61
- c. Topcoat: Dry fall, alkyd (MPI Gloss Level 3) [, MPI #89].
 - 1) S-W: Industrial & Marine Super Save-lite Dry Fall, B47W62
- d. Topcoat: Dry fall, alkyd, semi-gloss (MPI Gloss Level 5)[, MPI #225].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
- 8. Aluminum Paint System (Cementitious Primer) [MPI INT 5.3G]:
 - a. Prime Coat: Primer, galvanized, cementitious[, MPI #26].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - b. Intermediate Coat: Aluminum paint, matching topcoat.
 - c. Topcoat: Aluminum paint[, MPI #1].
 - 1) S-W: Protective & Marine Silver-Brite Aluminum, B59S11 S-W: Protective & Marine Industrial Aluminum Paint, B59S4
- H. Aluminum (Not Anodized or Otherwise Coated) Substrates:
 - 1. Latex System [**MPI INT 5.4H**]:
 - a. Prime Coat: Primer, quick dry, for aluminum[, MPI #95].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, **MPI #53**].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
 - d. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651

e. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].

1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951

- f. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
- g. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
- h. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].

1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611

- 2. Institutional Low-Odor/VOC Latex System [MPI INT 5.4G]:
 - a. Prime Coat: Primer, quick dry, for aluminum[, **MPI #95**].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
 - c. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1)[, MPI #143].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Acrylic Latex Flat, B05W01051(Odor Reducing, VOC Elimination Technologies)
 - d. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 2)[, MPI #144].
 - S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss EgShel, B09W01051
 S-W: Harmony Interior Acrylic Latex Eg-Shel, B09W01051 (Odor Reducing, VOC Elimination Technologies)
 - e. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3)[, MPI #145].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951

S-W: PaintShield Microbicidal Paint, EgShel, D12W00051 (This product is not listed in MPI #145 Category at this time. Product has the capability to kill bacteria such as: MRSA, Ecoli, Staph within 2 hours of contact.

Product MUST be applied by Brush and Roller application only. Registered with the EPA: No. 64695-1

- f. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 4)[, MPI #146].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- g. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5)[, MPI #147].
 - 1) S-W Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- h. Topcoat: Latex, interior, institutional low odor/VOC, gloss (MPI Gloss Level 6)[, **MPI #148**].
 - 1) S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 3. High-Performance Architectural Latex System [MPI INT 5.4F]:
 - a. Prime Coat: Primer, quick dry, for aluminum[, MPI #95].

1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.

- b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
- c. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 2)[, MPI #138].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss Eg-Shel, B41W01951
- d. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 3)[, MPI #139].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951 S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy Eg-Shel, K45W00151
- e. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 4)[, MPI #140].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- f. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5)[, **MPI #141**].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W1151
 S-W: Pro Industrial Acrylic Semi-Gloss Coating, B66W00651

- 4. Water-Based Light Industrial Coating System [MPI INT 5.4E]:
 - a. Prime Coat: Primer, quick dry, for aluminum[, MPI #95].

1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.

- b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
- c. Topcoat: Light industrial coating, interior, water based (MPI Gloss Level 3)[, MPI #151].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Eg-Shel, K45W1151
 SW: Pro Industrial DTM Acrylic Eg-Shel, B66W01251
- d. Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 5)[, MPI #153].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W00151
 S-W: Pro Industrial DTM Acrylic Semi-Gloss, B66W01151
- e. Topcoat: Light industrial coating, interior, water based, gloss (MPI Gloss Level 6)[, **MPI #154**].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 5. Alkyd System [MPI INT 5.4A] [MPI INT 5.4J]:
 - a. Prime Coat: Primer, vinyl wash[, **MPI #80**].
 - 1) S-W: Protective & Marine Industrial Wash Primer, P60G2/R7K44
 - b. Prime Coat: Primer, quick dry, for aluminum[, **MPI #95**].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - c. Intermediate Coat: Alkyd, interior, matching topcoat.
 - d. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1)[, MPI #49].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - e. Topcoat: Alkyd, interior (MPI Gloss Level 3)[, MPI #51].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - f. Topcoat: Alkyd, interior, semi-gloss (MPI Gloss Level 5)[, MPI #47].

1) S-W: ProMar 200 Alkyd Semi-Gloss Enamel, B34W00251

g. Topcoat: Alkyd, interior, gloss (MPI Gloss Level 6)[, MPI #48].

1) S-W: ProMar 200 Alkyd Gloss, B35W02251 W: Protective & Marine Industrial HS Enamel, B54WZ0401

I. Copper Substrates:

- 1. Latex System [MPI INT 5.5H]:
 - a. Prime Coat: Primer, quick dry, for aluminum[, MPI #95].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
 - d. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
 - e. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
 - f. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
 - g. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
 - h. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 2. Institutional Low-Odor/VOC Latex System [MPI INT 5.5G]:

S-

- a. Prime Coat: Primer, quick dry, for aluminum[, MPI #95].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
- b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
- c. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1)[, MPI #143].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Acrylic Latex Flat, B05W01051 (Odor Reducing, VOC Elimination Technologies)
- d. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 2)[, MPI #144].
 - S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss EgShel, B09W01051
 S-W: Harmony Interior Acrylic Latex Eg-Shel, B09W01051 (Odor Reducing, VOC Elimination Technologies)
- e. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3)[, MPI #145].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951

S-W: PaintShield Microbicidal Paint, EgShel, D12W00051 (This product is not listed in MPI #145 Category at this time. Product has the capability to kill bacteria such as: MRSA, Ecoli, Staph within 2 hours of contact. Product MUST be applied by Brush and Roller application only. Registered with the EPA: No. 64695-1

- f. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 4)[, MPI #146].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- g. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5)[, MPI #147].
 - 1) S-W Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- h. Topcoat: Latex, interior, institutional low odor/VOC, gloss (MPI Gloss Level 6)[, **MPI #148**].

1) S-W: Pro Industrial Acrylic Gloss Coating, B66W00611

- 3. High-Performance Architectural Latex System [MPI INT 5.5F]:
 - a. Prime Coat: Primer, quick dry, for aluminum[, MPI #95].

1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.

- b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
- c. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 2)[, MPI #138].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss Eg-Shel, B41W01951
- d. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 3)[, MPI #139].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951 S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy Eg-Shel, K45W00151
- e. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 4)[, MPI #140].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- f. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5)[, **MPI #141**].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W1151
 S-W: Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- 4. Water-Based Light Industrial Coating System [MPI INT 5.5E]:
 - a. Prime Coat: Primer, quick dry, for aluminum[, MPI #95].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
 - c. Topcoat: Light industrial coating, interior, water based (MPI Gloss Level 3)[, MPI #151].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Eg-Shel, K45W1151
 SW: Pro Industrial DTM Acrylic Eg-Shel, B66W01251
 - d. Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 5)[, MPI #153].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W1151
 S-W: Pro Industrial DTM Acrylic Semi-Gloss, B66W01151

- e. Topcoat: Light industrial coating, interior, water based, gloss (MPI Gloss Level 6)[, **MPI #154**].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 5. Alkyd System [**MPI INT 5.5A**]:
 - a. Prime Coat: Primer, vinyl wash[, MPI #80].
 - 1) S-W: Protective & Marine Industrial Wash Primer, P60G2/R7K44
 - b. Intermediate Coat: Alkyd, interior, matching topcoat.
 - c. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1)[, MPI #49].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - d. Topcoat: Alkyd, interior (MPI Gloss Level 3)[, MPI #51].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - e. Topcoat: Alkyd, interior, semi-gloss (MPI Gloss Level 5)[, MPI #47].
 - 1) S-W: ProMar 200 Alkyd Semi-Gloss Enamel, B34W00251
 - f. Topcoat: Alkyd, interior, gloss (MPI Gloss Level 6)[, MPI #48].
 - 1) S-W: ProMar 200 Alkyd Gloss, B35W02251 S-W: Protective & Marine Industrial HS Enamel, B54WZ0401
- J. Stainless Steel Substrates:
 - 1. Latex System [MPI INT 5.6H]:
 - a. Prime Coat: Primer, bonding, solvent based[, MPI #69].
 - 1) S-W: White Pigmented Shellac, B49W08150
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
 - d. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651

e. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].

1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951

- f. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
- g. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].

1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)

h. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].

1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611

- 2. High-Performance Architectural Latex System [MPI INT 5.6G]:
 - a. Prime Coat: Primer, bonding, solvent based[, MPI #69].
 - 1) S-W: White Pigmented Shellac, B49W08150
 - b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
 - c. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 2)[, MPI #138].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss Eg-Shel, B41W01951
 - d. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 3)[, MPI #139].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951 S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy Eg-Shel, K45W01151
 - e. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 4)[, MPI #140].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
 - f. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5)[, **MPI #141**].

- 1) S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W1151 S-W: Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- 3. Water-Based Light Industrial Coating System [MPI INT 5.6A] [MPI INT 5.6F]:
 - a. Prime Coat: Primer, bonding, solvent based[, MPI #69].
 - 1) S-W: White Pigmented Shellac, B49W08150
 - b. Prime Coat: Primer, quick dry, for aluminum[, MPI #95].

1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.

- c. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
- d. Topcoat: Light industrial coating, interior, water based (MPI Gloss Level 3)[, MPI #151].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Eg-Shel, K45W1151
 SW: Pro Industrial DTM Acrylic Eg-Shel, B66W01251
- e. Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 5)[, MPI #153].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W01151
 S-W: Pro Industrial DTM Acrylic Semi-Gloss, B66W01151
- f. Topcoat: Light industrial coating, interior, water based, gloss (MPI Gloss Level 6)[, **MPI #154**].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 4. Alkyd System [**MPI INT 5.6B**]:
 - a. Prime Coat: Primer, vinyl wash[, MPI #80].
 - 1) S-W: Protective & Marine Industrial Wash Primer, P60G2/R7K44
 - b. Intermediate Coat: Alkyd, interior, matching topcoat.
 - c. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1)[, MPI #49].

1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.

- d. Topcoat: Alkyd, interior (MPI Gloss Level 3)[, MPI #51].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.

e. Topcoat: Alkyd, interior, semi-gloss (MPI Gloss Level 5)[, MPI #47].

1) S-W: ProMar 200 Alkyd Semi-Gloss Enamel, B34W00251

f. Topcoat: Alkyd, interior, gloss (MPI Gloss Level 6)[, MPI #48].

1) S-W: ProMar 200 Alkyd Gloss, B35W02251 S-W: Protective & Marine Industrial HS Enamel, B54WZ0401

- K. Wood Substrates: Glued-laminated construction.
 - 1. Latex over Latex Primer System [MPI INT 6.1M]:
 - a. Prime Coat: Primer, latex, for interior wood[, MPI #39].
 - 1) S-W: Multi-Purpose Latex Primer / Sealer, B51W00450 S-W: PrepRite ProBlock Primer / Sealer, B51W0062
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
 - d. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
 - e. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
 - f. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
 - g. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
 - h. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611

- 2. Latex over Alkyd Primer System [MPI INT 6.1A]:
 - a. Prime Coat: Primer sealer, alkyd, interior[, MPI #45].
 - 1) S-W: ProBlock Interior Oil Based Primer, B79W08810
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
 - d. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
 - e. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
 - f. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
 - g. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
 - h. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 3. Institutional Low-Odor/VOC Latex System [MPI INT 6.1Q]:
 - a. Prime Coat: Primer, latex, for interior wood[, MPI #39].

- b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
- c. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1)[, MPI #143].

- 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Acrylic Latex Flat, B05W01051 (Odor Reducing, VOC Elimination Technologies)
- d. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 2)[, MPI #144].
 - S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss EgShel, B09W01051
 S-W: Harmony Interior Acrylic Latex Eg-Shel, B09W01051 (Odor Reducing, VOC Elimination Technologies)
- e. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3)[, MPI #145].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951

S-W: PaintShield Microbicidal Paint, EgShel, D12W00051 (This product is not listed in MPI #145 Category at this time. Product has the capability to kill bacteria such as: MRSA, Ecoli, Staph within 2 hours of contact. Product MUST be applied by Brush and Roller application only. Registered with the EPA: No. 64695-1

- f. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 4)[, MPI #146].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- g. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5)[, MPI #147].
 - 1) S-W Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- h. Topcoat: Latex, interior, institutional low odor/VOC, gloss (MPI Gloss Level 6)[, MPI #148].
 - 1) S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 4. High-Performance Architectural Latex System [MPI INT 6.1N]:
 - a. Prime Coat: Primer, latex, for interior wood[, MPI #39].

- b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
- c. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 2)[, MPI #138].

- 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss Eg-Shel, B41W01951
- d. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 3)[, MPI #139].
 - S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951 S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy Eg-Shel, K45W01151
- e. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 4)[, MPI #140].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- f. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5)[, **MPI #141**].
 - 1) S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W1151 S-W: Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- 5. Alkyd System [**MPI INT 6.1B**]:
 - a. Prime Coat: Primer sealer, alkyd, interior[, MPI #45].
 - 1) S-W: ProBlock Interior Oil Based Primer, B79W08810
 - b. Intermediate Coat: Alkyd, interior, matching topcoat.
 - c. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1)[, MPI #49].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - d. Topcoat: Alkyd, interior (MPI Gloss Level 3)[, MPI #51].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - e. Topcoat: Alkyd, interior, semi-gloss (MPI Gloss Level 5)[, MPI #47].
 - 1) S-W: ProMar 200 Alkyd Semi-Gloss Enamel, B34W00251
 - f. Topcoat: Alkyd, interior, gloss (MPI Gloss Level 6)[, MPI #48].
 - 1) S-W: ProMar 200 Alkyd Gloss, B35W02251 S-W: Protective & Marine Industrial HS Enamel, B54WZ0401
- L. Wood Substrates: Exposed framing.
 - 1. Latex over Latex Primer System [MPI INT 6.2D]:

a. Prime Coat: Primer, latex, for interior wood[, **MPI #39**].

- b. Intermediate Coat: Latex, interior, matching topcoat.
- c. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
- d. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
- e. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
- f. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
- g. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
- h. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 2. Latex over Alkyd Primer System [MPI INT 6.2A]:
 - a. Prime Coat: Primer sealer, alkyd, interior[, MPI #45].
 - 1) S-W: ProBlock Interior Oil Based Primer, B79W08810
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)

- d. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
- e. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
- f. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
- g. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
- h. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 3. Institutional Low-Odor/VOC Latex System [MPI INT 6.2L]:
 - a. Prime Coat: Primer, latex, for interior wood[, MPI #39].

- b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
- c. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1)[, MPI #143].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Acrylic Latex Flat, B05W01051 (Odor Reducing, VOC Elimination Technologies)
- d. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 2)[, MPI #144].
 - S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss EgShel, B09W01051
 S-W: Harmony Interior Acrylic Latex Eg-Shel, B09W01051 (Odor Reducing, VOC Elimination Technologies)
- e. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3)[, MPI #145].

1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951

S-W: PaintShield Microbicidal Paint, EgShel, D12W00051 (This product is not listed in MPI #145 Category at this time. Product has the capability to kill bacteria such as: MRSA, Ecoli, Staph within 2 hours of contact. Product MUST be applied by Brush and Roller application only. Registered with the EPA: No. 64695-1

Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 4)[, MPI #146].

2) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951

- f. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5)[, MPI #147].
 - 1) S-W Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- g. Topcoat: Latex, interior, institutional low odor/VOC, gloss (MPI Gloss Level 6)[, **MPI #148**].
 - 1) S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 4. High-Performance Architectural Latex System [MPI INT 6.2B]:
 - a. Prime Coat: Primer, latex, for interior wood[, MPI #39].
 - 1) S-W: Multi-Purpose Latex Primer / Sealer, B51W00450 S-W: PrepRite ProBlock Primer / Sealer, B51W00620
 - b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
 - c. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 2)[, MPI #138].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss Eg-Shel, B41W01951
 - d. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 3)[, MPI #139].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951 S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy Eg-Shel, K45W01151
 - e. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 4)[, MPI #140].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951

- f. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5)[, **MPI #141**].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W1151
 S-W: Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- 5. Alkyd System [**MPI INT 6.2C**]:
 - a. Prime Coat: Primer sealer, alkyd, interior[, MPI #45].
 - 1) S-W: ProBlock Interior Oil Based Primer, B79W08810
 - b. Intermediate Coat: Alkyd, interior, matching topcoat.
 - c. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1)[, MPI #49].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - d. Topcoat: Alkyd, interior (MPI Gloss Level 3)[, MPI #51].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - e. Topcoat: Alkyd, interior, semi-gloss (MPI Gloss Level 5)[, MPI #47].
 - 1) S-W: ProMar 200 Alkyd Semi-Gloss Enamel, B34W00251
 - f. Topcoat: Alkyd, interior, gloss (MPI Gloss Level 6)[, MPI #48].
 - 1) S-W: ProMar 200 Alkyd Gloss, B35W02251 S-W: Protective & Marine Industrial HS Enamel, B54WZ0401

M. Wood Substrates: [Wood trim] [Architectural woodwork] [Doors] [Windows] [and] [wood board paneling].

- 1. Latex over Latex Primer System [MPI INT 6.3T]:
 - a. Prime Coat: Primer, latex, for interior wood[, MPI #39].
 - 1) S-W: Multi-Purpose Latex Primer / Sealer, B51W00450 S-W: PrepRite ProBlock Primer / Sealer, B51W00620
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, **MPI #53**].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
 - d. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].

- 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
- e. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
- f. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
- g. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
- h. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 2. Latex over Alkyd Primer System [MPI INT 6.3U]:
 - a. Prime Coat: Primer sealer, alkyd, interior[, MPI #45].
 - 1) S-W: ProBlock Interior Oil Based Primer, B79W08810
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
 - d. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
 - e. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
 - f. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651

- g. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
- h. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 3. Institutional Low-Odor/VOC Latex System [MPI INT 6.3V]:
 - a. Prime Coat: Primer, latex, for interior wood[, MPI #39].
 - 1) S-W: Multi-Purpose Latex Primer / Sealer, B51W00450 S-W: PrepRite ProBlock Primer / Sealer, B51W00620
 - b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
 - c. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1)[, MPI #143].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Acrylic Latex Flat, B05W01051 (Odor Reducing, VOC Elimination Technologies)
 - d. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 2)[, MPI #144].
 - S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss EgShel, B09W01051
 S-W: Harmony Interior Acrylic Latex Eg-Shel, B09W01051 (Odor Reducing, VOC Elimination Technologies)
 - e. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3)[, MPI #145].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951

S-W: PaintShield Microbicidal Paint, EgShel, D12W00051 (This product is not listed in MPI #145 Category at this time. Product has the capability to kill bacteria such as: MRSA, Ecoli, Staph within 2 hours of contact. Product MUST be applied by Brush and Roller application only. Registered with the EPA: No. 64695-1

- f. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 4)[, MPI #146].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951

- g. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5)[, MPI #147].
 - 1) S-W Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- h. Topcoat: Latex, interior, institutional low odor/VOC, gloss (MPI Gloss Level 6)[, **MPI #148**].
 - 1) S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 4. High-Performance Architectural Latex System [MPI INT 6.3A]:
 - a. Prime Coat: Primer, latex, for interior wood[, MPI #39].

1) S-W: Multi-Purpose Latex Primer / Sealer, B51W00450 S-W: PrepRite ProBlock Primer / Sealer, B51W00620

- b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
- c. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 2)[, **MPI #138**].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss Eg-Shel, B41W01951
- d. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 3)[, MPI #139].
 - S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951 S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy Eg-Shel, K45W01151
- e. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 4)[, MPI #140].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- f. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5)[, **MPI #141**].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W1151
 S-W: Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- 5. Water-Based Light Industrial Coating System [MPI INT 6.3P]:
 - a. Prime Coat: Primer sealer, alkyd, interior[, MPI #45].

1) S-W: ProBlock Interior Oil Based Primer, B79W08810

b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.

- c. Topcoat: Light industrial coating, interior, water based (MPI Gloss Level 3)[, MPI #151].
 - 1) S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Eg-Shel, K45W1151 SW: Pro Industrial DTM Acrylic Eg-Shel, B66W01251
- d. Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 5)[, MPI #153].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W01151
 S-W: Pro Industrial DTM Acrylic Semi-Gloss, B66W01151
- e. Topcoat: Light industrial coating, interior, water based, gloss (MPI Gloss Level 6)[, **MPI #154**].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 6. Water-Based Alkyd System [**MPI INT 6.3BB**]:
 - a. Prime Coat: Primer, latex, for interior wood[, MPI #39].
 - 1) S-W: Multi-Purpose Latex Primer / Sealer, B51W00450 S-W: PrepRite ProBlock Primer / Sealer, B51W00620
 - b. Intermediate Coat: Alkyd, water based, matching topcoat.
 - c. Topcoat: Alkyd, water based, gloss (MPI Gloss Level 6-7)[, MPI #157].
 - 1) S-W: Protective & Marine Waterbased Industrial Enamel, B53W00311
- 7. Alkyd System [**MPI INT 6.3B**]:
 - a. Prime Coat: Primer sealer, alkyd, interior[, MPI #45].
 - 1) S-W: ProBlock Interior Oil Based Primer, B79W08810
 - b. Intermediate Coat: Alkyd, interior, matching topcoat.
 - c. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1)[, MPI #49].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - d. Topcoat: Alkyd, interior (MPI Gloss Level 3)[, MPI #51].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - e. Topcoat: Alkyd, interior, semi-gloss (MPI Gloss Level 5)[, MPI #47].
 - 1) S-W: ProMar 200 Alkyd Semi-Gloss Enamel, B34W00251

f. Topcoat: Alkyd, interior, gloss (MPI Gloss Level 6)[, MPI #48].

1) S-W: ProMar 200 Alkyd Gloss, B35W02251 S-W: Protective & Marine Industrial HS Enamel, B54WZ0401

- N. Wood Substrates: [Wood paneling] [and] [casework].
 - 1. Latex over Latex Primer System [MPI INT 6.4R]:
 - a. Prime Coat: Primer, latex, for interior wood[, MPI #39].

1) S-W: Multi-Purpose Latex Primer / Sealer, B51W00450 S-W: PrepRite ProBlock Primer / Sealer, B51W00620

- b. Intermediate Coat: Latex, interior, matching topcoat.
- c. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
- d. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
- e. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
- f. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
- g. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
- h. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].

1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611

- 2. Latex over Alkyd Sealer System [MPI INT 6.4A]:
 - a. Prime Coat: Primer sealer, alkyd, interior[, MPI #45].

1) S-W: ProBlock Interior Oil Based Primer, B79W08810

- b. Intermediate Coat: Latex, interior, matching topcoat.
- c. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
- d. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
- e. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
- f. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
- g. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
- h. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 3. Institutional Low-Odor/VOC Latex System [MPI INT 6.4T]:
 - a. Prime Coat: Primer, latex, for interior wood[, MPI #39].
 - 1) S-W: Multi-Purpose Latex Primer / Sealer, B51W00450 S-W: PrepRite ProBlock Primer / Sealer, B51W00620
 - b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
 - c. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1)[, MPI #143].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Acrylic Latex Flat, B05W01051 (Odor Reducing, VOC Elimination Technologies)

- d. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 2)[, MPI #144].
 - S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss EgShel, B09W01051
 S-W: Harmony Interior Acrylic Latex Eg-Shel, B09W01051 (Odor Reducing, VOC Elimination Technologies)
- e. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3)[, MPI #145].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951

S-W: PaintShield Microbicidal Paint, EgShel, D12W00051 (This product is not listed in MPI #145 Category at this time. Product has the capability to kill bacteria such as: MRSA, Ecoli, Staph within 2 hours of contact. Product MUST be applied by Brush and Roller application only. Registered with the EPA: No. 64695-1

- f. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 4)[, MPI #146].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- g. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5)[, MPI #147].
 - 1) S-W Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- h. Topcoat: Latex, interior, institutional low odor/VOC, gloss (MPI Gloss Level 6)[, **MPI #148**].
 - 1) S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 4. High-Performance Architectural Latex System [MPI INT 6.4S]:
 - a. Prime Coat: Primer, latex, for interior wood[, MPI #39].

1) S-W: Multi-Purpose Latex Primer / Sealer, B51W00450 S-W: PrepRite ProBlock Primer / Sealer, B51W00620

- b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
- c. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 2)[, MPI #138].

1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss Eg-Shel, B41W01951

d. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 3)[, MPI #139].

- 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951 S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy Eg-Shel, K45W01151
- e. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 4)[, MPI #140].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- f. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5)[, **MPI #141**].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W1151
 S-W: Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- 5. Water-Based Light Industrial Coating System [MPI INT 6.4N]:
 - a. Prime Coat: Primer sealer, alkyd, interior[, MPI #45].
 - 1) S-W: ProBlock Interior Oil Based Primer, B79W08810
 - b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
 - c. Topcoat: Light industrial coating, interior, water based (MPI Gloss Level 3)[, MPI #151].
 - 1) S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Eg-Shel, K45W1151 SW: Pro Industrial DTM Acrylic Eg-Shel, B66W01251
 - d. Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 5)[, MPI #153].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W01151
 S-W: Pro Industrial DTM Acrylic Semi-Gloss, B66W01151
 - e. Topcoat: Light industrial coating, interior, water based, gloss (MPI Gloss Level 6)[, **MPI #154**].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 6. Alkyd System [**MPI INT 6.4B**]:
 - a. Prime Coat: Primer sealer, alkyd, interior[, MPI #45].
 - 1) S-W: ProBlock Interior Oil Based Primer, B79W08810
 - b. Intermediate Coat: Alkyd, interior, matching topcoat.
 - c. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1)[, MPI #49].

- 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
- d. Topcoat: Alkyd, interior (MPI Gloss Level 3)[, MPI #51].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
- e. Topcoat: Alkyd, interior, semi-gloss (MPI Gloss Level 5)[, MPI #47].
 - 1) S-W: ProMar 200 Alkyd Semi-Gloss Enamel, B34W00251
- f. Topcoat: Alkyd, interior, gloss (MPI Gloss Level 6)[, MPI #48].
 - 1) S-W: ProMar 200 Alkyd Gloss, B35W02251 S-W: Protective & Marine Industrial HS Enamel, B54WZ0401
- O. Wood Substrates: Traffic surfaces, including [floors] [and] [stairs].
 - 1. Latex Porch & Floor Enamel System [MPI INT 6.5G]:
 - a. Prime Coat: Primer sealer, alkyd, interior[, MPI #45].

1) S-W: ProBlock Interior Oil Based Primer, B79W08810

- b. Intermediate Coat: Floor paint, latex, matching topcoat.
- c. Topcoat: Floor paint, latex, low gloss (maximum MPI Gloss Level 3)[, MPI #60].

1) S-W: Protective & Marine ArmorSeal Tread-Plex, B90W111

- 2. Alkyd Floor Enamel System [**MPI INT 6.5A**]:
 - a. Prime Coat: Floor enamel, alkyd, matching topcoat.
 - b. Intermediate Coat: Floor enamel, alkyd, matching topcoat.
 - c. Topcoat: Floor enamel, alkyd, gloss (MPI Gloss Level 6)[, MPI #27].

1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.

- P. Wood Substrates: Wood shingles and shakes.
 - 1. Latex over Latex Primer System [MPI INT 6.6F]:
 - a. Prime Coat: Primer, latex, for interior wood[, MPI #39].

- b. Intermediate Coat: Latex, interior, matching topcoat.
- c. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].

- 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
- d. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
- e. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
- f. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
- g. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
- h. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 2. Latex over Alkyd Primer System [MPI INT 6.6A]:
 - a. Prime Coat: Primer sealer, alkyd, interior[, MPI #45].
 - 1) S-W: ProBlock Interior Oil Based Primer, B79W08810
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
 - d. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
 - e. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].

- 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
- f. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
- g. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
- h. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 3. Alkyd System [**MPI INT 6.6B**]:
 - a. Prime Coat: Primer sealer, alkyd, interior[, MPI #45].
 - 1) S-W: ProBlock Interior Oil Based Primer, B79W08810
 - b. Intermediate Coat: Alkyd, interior, matching topcoat.
 - c. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1)[, MPI #49].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - d. Topcoat: Alkyd, interior (MPI Gloss Level 3)[, MPI #51].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - e. Topcoat: Alkyd, interior, semi-gloss (MPI Gloss Level 5)[, MPI #47].
 - 1) S-W: ProMar 200 Alkyd Semi-Gloss Enamel, B34W00251
 - f. Topcoat: Alkyd, interior, gloss (MPI Gloss Level 6)[, MPI #48].
 - 1) S-W: ProMar 200 Alkyd Gloss, B35W02251 S-W: Protective & Marine Industrial HS Enamel, B54WZ0401
- Q. Fiberglass Substrates:
 - 1. Latex System [MPI INT 6.7AA] [MPI INT 6.7A]:
 - a. Prime Coat: Primer, bonding, water based[, MPI #17].

1) S-W: Extreme Bond Interior / Exterior Bonding Primer, B51W00150 S-W: Multi-Purpose Latex Primer / Sealer, B51W00450

b. Prime Coat: Primer, bonding, solvent based[, MPI #69].

1) S-W: White Pigmented Shellac, B49W08150

- c. Intermediate Coat: Latex, interior, matching topcoat.
- d. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
- e. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
- f. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
- g. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
- h. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
- i. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 2. Institutional Low-Odor/VOC Latex System [MPI INT 6.7J]:
 - a. Prime Coat: Primer, bonding, water based[, MPI #17].
 - 1) S-W: Extreme Bond Interior / Exterior Bonding Primer, B51W00150 S-W: Multi-Purpose Latex Primer / Sealer, B51W00450
 - b. Prime Coat: Primer, bonding, solvent based[, MPI #69].
 - 1) S-W: White Pigmented Shellac, B49W08150

- c. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
- d. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1)[, MPI #143].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Acrylic Latex Flat, B05W01051 (Odor Reducing, VOC Elimination Technologies)
- e. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 2)[, MPI #144].
 - S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss EgShel, B09W01051
 S-W: Harmony Interior Acrylic Latex Eg-Shel, B09W01051 (Odor Reducing, VOC Elimination Technologies)
- f. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3)[, MPI #145].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951

S-W: PaintShield Microbicidal Paint, EgShel, D12W00051 (This product is not listed in MPI #145 Category at this time. Product has the capability to kill bacteria such as: MRSA, Ecoli, Staph within 2 hours of contact. Product MUST be applied by Brush and Roller application only. Registered with the EPA: No. 64695-1

- g. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 4)[, MPI #146].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- h. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5)[, MPI #147].
 - 1) S-W Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- i. Topcoat: Latex, interior, institutional low odor/VOC, gloss (MPI Gloss Level 6)[, MPI #148].
 - 1) S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 3. High-Performance Architectural Latex System [MPI INT 6.7H]:
 - a. Prime Coat: Primer, bonding, water based[, MPI #17].
 - 1) S-W: Extreme Bond Interior / Exterior Bonding Primer, B51W00150 S-W: Multi-Purpose Latex Primer / Sealer, B51W00450
 - b. Prime Coat: Primer, bonding, solvent based[, MPI #69].

1) S-W: White Pigmented Shellac, B49W08150

- c. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
- d. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 2)[, MPI #138].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss Eg-Shel, B41W01951
- e. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 3)[, MPI #139].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951 S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy Eg-Shel, K45W01151
- f. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 4)[, MPI #140].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- g. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5)[, **MPI #141**].
 - 1) S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W1151 S-W: Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- 4. Water-Based Light Industrial Coating System [**MPI INT 6.7C**]:
 - a. Prime Coat: Primer, bonding, water based[, MPI #17].
 - 1) S-W: Extreme Bond Interior / Exterior Bonding Primer, B51W00150 S-W: Multi-Purpose Latex Primer / Sealer, B51W00450
 - b. Prime Coat: Primer, bonding, solvent based[, MPI #69].
 - 1) S-W: White Pigmented Shellac, B49W08150
 - c. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
 - d. Topcoat: Light industrial coating, interior, water based (MPI Gloss Level 3)[, MPI #151].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Eg-Shel, K45W1151
 SW: Pro Industrial DTM Acrylic Eg-Shel, B66W01251
 - e. Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 5)[, MPI #153].
- 1) S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W01151 S-W: Pro Industrial DTM Acrylic Semi-Gloss, B66W01151
- f. Topcoat: Light industrial coating, interior, water based, gloss (MPI Gloss Level 6)[, **MPI #154**].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 5. Alkyd System [**MPI INT 6.7B**]:
 - a. Prime Coat: Primer, bonding, water based[, MPI #17].
 - 1) S-W: Extreme Bond Interior / Exterior Bonding Primer, B51W00150 S-W: Multi-Purpose Latex Primer / Sealer, B51W00450
 - b. Prime Coat: Primer, bonding, solvent based[, MPI #69].
 - 1) S-W: White Pigmented Shellac, B49W08150
 - c. Intermediate Coat: Alkyd, interior, matching topcoat.
 - d. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1)[, MPI #49].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - e. Topcoat: Alkyd, interior (MPI Gloss Level 3)[, MPI #51].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - f. Topcoat: Alkyd, interior, semi-gloss (MPI Gloss Level 5)[, MPI #47].
 - 1) S-W: ProMar 200 Alkyd Semi-Gloss Enamel, B34W00251
 - g. Topcoat: Alkyd, interior, gloss (MPI Gloss Level 6)[, MPI #48].
 - 1) S-W: ProMar 200 Alkyd Gloss, B35W02251 S-W: Protective & Marine Industrial HS Enamel, B54WZ0401
- R. Plastic Substrates:
 - 1. Latex System [MPI INT 6.8E]:
 - a. Prime Coat: Primer, bonding, solvent based[, MPI #69].
 - 1) S-W: White Pigmented Shellac, B49W08150
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].

- 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
- d. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
- e. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
- f. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
- g. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
- h. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 2. Institutional Low-Odor/VOC Latex System [MPI INT 6.8F]:
 - a. Prime Coat: Primer, bonding, solvent based[, MPI #69].
 - 1) S-W: White Pigmented Shellac, B49W08150
 - b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
 - c. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1)[, MPI #143].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Acrylic Latex Flat, B05W01051 (Odor Reducing, VOC Elimination Technologies)
 - d. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 2)[, MPI #144].
 - S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss EgShel, B09W01051
 S-W: Harmony Interior Acrylic Latex Eg-Shel, B09W01051 (Odor Reducing, VOC Elimination Technologies)

- e. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3)[, MPI #145].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951

S-W: PaintShield Microbicidal Paint, EgShel, D12W00051 (This product is not listed in MPI #145 Category at this time. Product has the capability to kill bacteria such as: MRSA, Ecoli, Staph within 2 hours of contact. Product MUST be applied by Brush and Roller application only. Registered with the EPA: No. 64695-1

- f. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 4)[, MPI #146].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- g. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5)[, MPI #147].
 - 1) S-W Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- h. Topcoat: Latex, interior, institutional low odor/VOC, gloss (MPI Gloss Level 6)[, **MPI #148**].
 - 1) S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 3. High-Performance Architectural Latex System [MPI INT 6.8A]:
 - a. Prime Coat: Primer, bonding, solvent based[, MPI #69].
 - 1) S-W: White Pigmented Shellac, B49W08150
 - b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
 - c. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 2)[, MPI #138].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss Eg-Shel, B41W01951
 - d. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 3)[, MPI #139].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951 S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy Eg-Shel, K45W01151
 - e. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 4)[, MPI #140].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951

- f. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5)[, **MPI #141**].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W1151
 S-W: Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- 4. Water-Based Light Industrial Coating System [MPI INT 6.8C]:
 - a. Prime Coat: Primer, bonding, solvent based[, MPI #69].
 - 1) S-W: White Pigmented Shellac, B49W08150
 - b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
 - c. Topcoat: Light industrial coating, interior, water based (MPI Gloss Level 3)[, MPI #151].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Eg-Shel, K45W1151
 SW: Pro Industrial DTM Acrylic Eg-Shel, B66W01251
 - d. Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 5)[, MPI #153].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W01151
 S-W: Pro Industrial DTM Acrylic Semi-Gloss, B66W01151
 - e. Topcoat: Light industrial coating, interior, water based, gloss (MPI Gloss Level 6)[, **MPI #154**].

1) S-W: Pro Industrial DTM Acrylic Gloss, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611

- 5. Alkyd System [**MPI INT 6.8B**]:
 - a. Prime Coat: Primer, bonding, solvent based[, MPI #69].
 - 1) S-W: White Pigmented Shellac, B49W08150
 - b. Intermediate Coat: Alkyd, interior, matching topcoat.
 - c. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1)[, MPI #49].

1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.

- d. Topcoat: Alkyd, interior (MPI Gloss Level 3)[, MPI #51].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
- e. Topcoat: Alkyd, interior, semi-gloss (MPI Gloss Level 5)[, MPI #47].

1) S-W: ProMar 200 Alkyd Semi-Gloss Enamel, B34W00251

f. Topcoat: Alkyd, interior, gloss (MPI Gloss Level 6)[, MPI #48].

1) S-W: ProMar 200 Alkyd Gloss, B35W02251 W: Protective & Marine Industrial HS Enamel, B54WZ0401

- S. Spray-Textured Ceiling Substrates:
 - 1. Latex, Flat System [**MPI INT 9.1A**]: Spray applied.
 - a. Prime Coat: Latex, interior, flat, matching topcoat.
 - b. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
 - 2. Latex System [MPI INT 9.1E]: Spray applied.
 - a. Prime Coat: Latex, interior, matching topcoat.
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
 - d. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
 - e. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
 - f. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
 - g. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
 - h. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].

S-

- 1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 3. Latex over Alkyd Sealer System [MPI INT 9.1B]:
 - a. Prime Coat: Primer sealer, alkyd, interior[, MPI #45].
 - 1) S-W: ProBlock Interior Oil Based Primer, B79W08810
 - b. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
 - c. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
 - d. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
 - e. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
 - f. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
 - g. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 4. Alkyd, Flat System [**MPI INT 9.1C**]:
 - a. Prime Coat: Alkyd, interior, flat matching topcoat.
 - b. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1)[, MPI #49].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
- 5. Alkyd over Alkyd Sealer System [**MPI INT 9.1D**]:

a. Prime Coat: Primer sealer, alkyd, interior[, MPI #45].

1) S-W: ProBlock Interior Oil Based Primer, B79W08810

- b. Intermediate Coat: Alkyd, interior, matching topcoat.
- c. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1)[, MPI #49].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
- d. Topcoat: Alkyd, interior (MPI Gloss Level 3)[, MPI #51].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
- e. Topcoat: Alkyd, interior, semi-gloss (MPI Gloss Level 5)[, MPI #47].
 - 1) S-W: ProMar 200 Alkyd Semi-Gloss Enamel, B34W00251
- f. Topcoat: Alkyd, interior, gloss (MPI Gloss Level 6)[, MPI #48].

1) S-W: ProMar 200 Alkyd Gloss, B35W02251 S-W: Protective & Marine Industrial HS Enamel, B54WZ0401

- T. [Gypsum Board] [and] [Plaster] Substrates:
 - 1. Latex over Latex Sealer System [MPI INT 9.2A]:
 - a. Prime Coat: Primer sealer, latex, interior[, MPI #50].

1) S-W: ProMar 200 Zero VOC Interior Latex Primer, B28W02600 S-W: Harmony Interior Latex Primer, B11W01500

- b. Prime Coat: Latex, interior, matching topcoat.
- c. Intermediate Coat: Latex, interior, matching topcoat.
- d. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
- e. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
- f. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951

- g. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
- h. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
- i. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].

1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611

- 2. Latex over Alkyd Primer System (for Plaster Only) [MPI INT 9.2K]:
 - a. Prime Coat: Primer sealer, alkyd, interior[, MPI #45].
 - 1) S-W: ProBlock Interior Oil Based Primer, B79W08810
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
 - 2) Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
 - d. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
 - e. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
 - f. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
 - g. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].

1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611

- 3. Institutional Low-Odor/VOC Latex System [MPI INT 9.2M]:
 - a. Prime Coat: Primer sealer, interior, institutional low odor/VOC[, MPI #149].

1) S-W ProMar 200 Zero VOC Interior Latex Primer, B28W02600 S-W: Harmony Interior Latex Primer, B11W01500

- b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
- c. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1)[, MPI #143].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Acrylic Latex Flat, B05W01051 (Odor Reducing, VOC Elimination Technologies)
- d. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 2)[, MPI #144].
 - S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss EgShel, B09W01051
 S-W: Harmony Interior Acrylic Latex Eg-Shel, B09W01051 (Odor Reducing, VOC Elimination Technologies)
- e. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3)[, MPI #145].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951

S-W: PaintShield Microbicidal Paint, EgShel, D12W00051 (This product is not listed in MPI #145 Category at this time. Product has the capability to kill bacteria such as: MRSA, Ecoli, Staph within 2 hours of contact. Product MUST be applied by Brush and Roller application only. Registered with the EPA: No. 64695-1

- f. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 4)[, MPI #146].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- g. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5)[, MPI #147].
 - 1) S-W Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- h. Topcoat: Latex, interior, institutional low odor/VOC, gloss (MPI Gloss Level 6)[, **MPI #148**].

1) S-W: Pro Industrial Acrylic Gloss Coating, B66W00611

- 4. High-Performance Architectural Latex System [MPI INT 9.2B]:
 - a. Prime Coat: Primer sealer, latex, interior[, MPI #50].

1) S-W: ProMar 200 Zero VOC Interior Latex Primer, B28W02600 S-W: Harmony Interior Latex Primer, B11W01500

- b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
- c. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 2)[, MPI #138].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss Eg-Shel, B41W01951
- d. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 3)[, MPI #139].
 - S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951 S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy Eg-Shel, K45W01151
- e. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 4)[, MPI #140].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- f. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5)[, MPI #141].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W1151
 S-W: Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- 5. Water-Based Light Industrial Coating System [MPI INT 9.2L]:
 - a. Prime Coat: Primer sealer, latex, interior[, MPI #50].

1) S-W: ProMar 200 Zero VOC Interior Latex Primer, B28W02600 S-W: Harmony Interior Latex Primer, B11W01500

- b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
- c. Topcoat: Light industrial coating, interior, water based (MPI Gloss Level 3)[, MPI #151].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Eg-Shel, K45W1151
 SW: Pro Industrial DTM Acrylic Eg-Shel, B66W01251

- d. Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 5)[, MPI #153].
 - 1) S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W01151 S-W: Pro Industrial DTM Acrylic Semi-Gloss, B66W01151
- e. Topcoat: Light industrial coating, interior, water based, gloss (MPI Gloss Level 6)[, **MPI #154**].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 6. Alkyd over Latex Sealer System [MPI INT 9.2C]:
 - a. Prime Coat: Primer sealer, latex, interior[, MPI #50].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Primer, B28W02600 S-W: Harmony Interior Latex Primer, B11W01500
 - b. Intermediate Coat: Alkyd, interior, matching topcoat.
 - c. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1)[, MPI #49].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - d. Topcoat: Alkyd, interior (MPI Gloss Level 3)[, MPI #51].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
 - e. Topcoat: Alkyd, interior, semi-gloss (MPI Gloss Level 5)[, MPI #47].
 - 1) S-W: ProMar 200 Alkyd Semi-Gloss Enamel, B34W00251
 - f. Topcoat: Alkyd, interior, gloss (MPI Gloss Level 6)[, MPI #48].
 - 1) S-W: ProMar 200 Alkyd Gloss, B35W02251 S-W: Protective & Marine Industrial HS Enamel, B54WZ0401
- U. Acoustic Panels and Tiles:
 - 1. Latex, Flat System [MPI INT 9.3A]:
 - a. Prime Coat: Latex, interior, matching topcoat.
 - b. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
 - 2. Latex over Alkyd Sealer System [MPI INT 9.3B]:

INTERIOR PAINTING

- a. Prime Coat: Primer sealer, alkyd, interior[, MPI #45].
 - 1) S-W: ProBlock Interior Oil Based Primer, B79W08810
- b. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
- c. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
- d. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
- e. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
- f. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
- g. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].

1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611

- 3. Institutional Low-Odor/VOC Latex System [MPI INT 9.3D]:
 - a. Prime Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
 - b. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1)[, MPI #143].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Acrylic Latex Flat, B05W01051 (Odor Reducing, VOC Elimination Technologies)
 - c. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 2)[, MPI #144].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss EgShel, B09W01051

S-W: Harmony Interior Acrylic Latex Eg-Shel, B09W01051 (Odor Reducing, VOC Elimination Technologies)

- d. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3)[, MPI #145].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951

S-W: PaintShield Microbicidal Paint, EgShel, D12W00051 (This product is not listed in MPI #145 Category at this time. Product has the capability to kill bacteria such as: MRSA, Ecoli, Staph within 2 hours of contact. Product MUST be applied by Brush and Roller application only. Registered with the EPA: No. 64695-1

- e. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 4)[, MPI #146].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- f. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5)[, MPI #147].
 - 1) S-W Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- g. Topcoat: Latex, interior, institutional low odor/VOC, gloss (MPI Gloss Level 6)[, MPI #148].
 - 1) S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 4. High-Performance Architectural Latex System [MPI INT 9.3E]:
 - a. Prime Coat: Latex, interior, high performance architectural, matching topcoat.
 - b. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 2)[, MPI #138].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss Eg-Shel, B41W01951
 - c. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 3)[, MPI #139].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951 S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy Eg-Shel, K45W01151
 - d. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 4)[, MPI #140].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951

- e. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5)[, **MPI #141**].
 - S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46W1151
 S-W: Pro Industrial Acrylic Semi-Gloss Coating, B66W00651
- 5. Alkyd, Flat System [**MPI INT 9.3C**]:
 - a. Prime Coat: Alkyd, interior, matching topcoat.
 - b. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1)[, MPI #49].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
- V. [Cotton or Canvas] [and] [ASJ] Insulation-Covering Substrates: Including [pipe and duct coverings] <Insert description>.
 - 1. Latex System [MPI INT 10.1A]:
 - a. Prime Coat: Primer sealer, latex, interior[, MPI #50].

1) S-W: ProMar 200 Zero VOC Interior Latex Primer, B28W02600 S-W: Harmony Interior Latex Primer, B11W01500

- b. Intermediate Coat: Latex, interior, matching topcoat.
- c. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
- d. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
- e. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
- f. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
- g. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)

- h. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].
 - 1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 2. Institutional Low-Odor/VOC Latex System [MPI INT 10.1D]:
 - a. Prime Coat: Primer sealer, latex, interior[, MPI #50].

1) S-W: ProMar 200 Zero VOC Interior Latex Primer, B28W02600 S-W: Harmony Interior Latex Primer, B11W01500

- b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
- c. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1)[, MPI #143].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Acrylic Latex Flat, B05W01051 (Odor Reducing, VOC Elimination Technologies)
- d. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 2)[, MPI #144].
 - S-W: ProMar 200 HP Zero VOC Interior Acrylic Low Gloss EgShel, B09W01051
 S-W: Harmony Interior Acrylic Latex Eg-Shel, B09W01051 (Odor Reducing, VOC Elimination Technologies)
- e. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3)[, MPI #145].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Eg-Shel, B20W01951

S-W: PaintShield Microbicidal Paint, EgShel, D12W00051 (This product is not listed in MPI #145 Category at this time. Product has the capability to kill bacteria such as: MRSA, Ecoli, Staph within 2 hours of contact. Product MUST be applied by Brush and Roller application only. Registered with the EPA: No. 64695-1

- f. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 4)[, MPI #146].
 - 1) S-W: ProMar 200 HP Zero VOC Interior Acrylic Semi-Gloss, B31W01951
- g. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5)[, MPI #147].
 - 1) S-W Pro Industrial Acrylic Semi-Gloss Coating, B66W00651

- h. Topcoat: Latex, interior, institutional low odor/VOC, gloss (MPI Gloss Level 6)[, MPI #148].
 - 1) S-W: Pro Industrial Acrylic Gloss Coating, B66W00611
- 3. Alkyd System [**MPI INT 10.1B**]:
 - a. Prime Coat: Primer sealer, latex, interior[, MPI #50].

1) S-W: ProMar 200 Zero VOC Interior Latex Primer, B28W02600 S-W: Harmony Interior Latex Primer, B11W01500

- b. Intermediate Coat: Alkyd, interior, matching topcoat.
- c. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1)[, MPI #49].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
- d. Topcoat: Alkyd, interior, (MPI Gloss Level 3)[, MPI #51].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
- e. Topcoat: Alkyd, interior, semi-gloss (MPI Gloss Level 5)[, MPI #47].
 - 1) S-W: ProMar 200 Alkyd Semi-Gloss Enamel, B34W00251
- f. Topcoat: Alkyd, interior, gloss (MPI Gloss Level 6)[, MPI #48].
 - 1) S-W: ProMar 200 Alkyd Gloss, B35W02251 S-W: Protective & Marine Industrial HS Enamel, B54WZ0401
- 4. Aluminum Paint System [**MPI INT 10.1C**]:
 - a. Prime Coat: Primer sealer, latex, interior[, MPI #50].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Primer, B28W02600 S-W: Harmony Interior Latex Primer, B11W01500
 - b. Intermediate Coat: Aluminum paint matching topcoat.
 - c. Topcoat: Aluminum paint[, MPI #1].

1) S-W: Protective & Marine Silver Brite Aluminum, B59W11 S-W: Protective & Marine Industrial Aluminum Paint, B59S4

- W. Bituminous-Coated Substrates:
 - 1. Latex System [MPI INT 10.2A]:
 - a. Prime Coat: Primer, rust inhibitive, water based[, MPI #107].
 - 1) S-W: Pro Industrial Pro-Cryl Universal Primer, B66W01310

- b. Intermediate Coat: Latex, interior, matching topcoat.
- c. Topcoat: Latex, interior, flat (MPI Gloss Level 1)[, MPI #53].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W12651 S-W: Harmony Interior Latex Flat, B05W01051 (Odor reducing, VOC Eliminating Technology)
- d. Topcoat: Latex, interior (MPI Gloss Level 2)[, MPI #44].
 - 1) S-W: ProMar 200 Zero VOC Latex Low Sheen, B24W02651 S-W: ProMar 200 HP Zero VOC Interior Latex Low Gloss EgShel, B41W02651
- e. Topcoat: Latex, interior (MPI Gloss Level 3)[, MPI #52].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20W12651 S-W: ProMar 200 HP Zero VOC Interior Acrylic EgShel, B20W01951
- f. Topcoat: Latex, interior (MPI Gloss Level 4)[, MPI #43].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651
- g. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)[, MPI #54].
 - 1) S-W: ProMar 200 Zero VOC Interior Latex Gloss, B21W12651 S-W: Harmony Interior Latex Semi-Gloss, B10W01051 (Odor Reducing, VOC Elimination Technologies)
- h. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees)[, MPI #114].

1) S-W: Pro Industrial DTM Acrylic Gloss Coating, B66W01051 S-W Pro Industrial Acrylic Gloss Coating, B66W00611

- 2. Alkyd System [MPI INT 10.2B]:
 - a. Prime Coat: Primer, rust inhibitive, water based[, MPI #107].
 - 1) S-W: Pro Industrial Pro-Cryl Universal Primer, B66W01310
 - b. Intermediate Coat: Alkyd, interior, matching topcoat.
 - c. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1)[, MPI #49].

1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.

- d. Topcoat: Alkyd, interior (MPI Gloss Level 3)[, MPI #51].
 - 1) S-W: Currently does not have a product listed in this category. Contact your local SW Rep for additional product options.
- e. Topcoat: Alkyd, interior, semi-gloss (MPI Gloss Level 5)[, MPI #47].

1) S-W: ProMar 200 Alkyd Semi-Gloss Enamel, B34W00251

- f. Topcoat: Alkyd, interior, gloss (MPI Gloss Level 6)[, MPI #48].
 - 1) S-W: ProMar 200 Alkyd Gloss, B35W02251 S-W: Protective & Marine Industrial HS Enamel, B54WZ0401
- 3. Aluminum Paint System [MPI INT 10.2C]:
 - a. Prime Coat: Primer, rust inhibitive, water based[, MPI #107].
 - 1) S-W: Pro Industrial Pro-Cryl Universal Primer, B66W01310
 - b. Intermediate Coat: Aluminum paint, matching topcoat.
 - c. Topcoat: Aluminum paint[, MPI #1].
 - 1) S-W: Protective & Marine Silver Brite Aluminum, B59W11 S-W: Protective & Marine Industrial Aluminum Paint, B59S4

END OF SECTION 099123

SECTION 114000 - FOOD SERVICE EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. All work included under this section is subject to Architect's provisions covering: Invitation to Bid, Proposal Form, Instructions to Bidders, General Conditions, and all other Supplementary General Conditions as may be added.

1.2 SCOPE OF WORK

- A. All specified equipment to be delivered to job site, freight prepaid, uncrated, assembled and set in place, ready for final connections, where required, as specified in Divisions 22 0000 and 26 0000 of Performance Criteria.
- B. Related Sections include the following:
 - 1. Division 22 0000/23 0000 Mechanical/HVAC
 - a. Provide all gas, water lines, drains and other necessary work including final connections to equipment.
 - b. Provide all ducts, to exhaust and supply fans to those hood(s) specified in this Section of Performance Criteria.
 - c. Provide all faucets, special switches, valves, traps, labor and materials to make final connections to equipment unless specified in this Section.
 - 2. Division 26 0000 Electrical
 - a. Provide all electrical utility lines, disconnect switches and other work including final connections to equipment.

1.3 DESCRIPTION

- A. The extent of the Food Service Equipment is shown on the Drawings, Equipment Schedule, and Specifications of this Section of Performance Criteria. Each model number includes the code *Co13 as a suffix. This code is known as the Specifier Identification System. It is not to be removed by the bidders. Its purpose is to identify the specifier to the vendors providing the equipment in the event it is necessary to communicate questions, clarifications and comments, from prior to bid award through the final purchase. It is to be used on all correspondence including fax and e-mail when communicating with manufacturer representatives and factories.
- B. The plans indicate the location of the equipment. Slight changes due to the varying dimensions of equipment and wall construction shall be permitted with approval by the Architect.

- C. These typed Specifications shall be closely correlated with the Drawings and Schedule. Each complements the other and cross-reference shall be necessary to fulfill the requirements of these Specifications. All information shown on Drawings and listed in Schedules are to be incorporated as part of the written Specifications.
- D. Conflict in Plans and Specifications where changes, alterations, additions, or deductions are necessary, or where exceptions are taken with regard to sizes, locations, and other details shown on plans, shall be reported in writing for a decision by the Architect.
- E. The Contractor shall be responsible for seeing that the equipment can be entered through openings before doors and walls are finished.

1.4 WORK BY OTHERS

- A. All Plumbing, Steam, Electrical and Ventilation Work required in connection with this section shall be done by the other Contractor, unless specifically called for in the itemized Equipment Specifications. Work of others shall include but not be limited to exhaust fans and duct work associated with the ventilation of hood, roughing-in to points indicated on the mechanical, plumbing, electrical plans, and final connections from rough-in points to various pieces equipment requiring such connections and the supplying of all necessary materials and labor for this work except as specified or scheduled.
- B. Tile bases, below various item is equipment shall be provided by others.
- C. Refrigeration Work to be performed under this section, except for electrical and plumbing connection to compressors, blower coils controls, etc. provided by others, is as listed in the itemized specifications.
- D. All line and disconnect switches, safety cut outs, control panels, fuse boxes or other electrical controls, fittings and connections shall be furnished and installed by others. Starting switches shall be provided by Food Service Equipment Supplier as specified under General Specifications. Those starting switches furnished loose as standardized by Food Service Equipment Supplier manufacturers (other than fabricated items) shall be installed and connected by others.
- E. Any sleeves or conduit required for refrigeration and tubing lines shall be furnished and installed by others. Refrigeration alarm system connection by others.
- F. Plumbing and Steam Fitting Trades shall confirm that all lines are flushed free of foreign matter before connecting equipment.
- G. The electrical sub-contractor shall make all final connections to equipment shown on Drawings or specified, and it shall be the responsibility of the electrical sub-contractor to check all equipment to determine where starters, contractors, switches and other items are required.

- H. The plumbing-sub-contractor shall make all final connection to equipment shown on Drawings or specified and it shall be the responsibility of the plumbing sub-contractor to provide traps, tail pieces and fittings, water piping, floor drains, shut off valves and all other necessary fittings. The Food Equipment Supplier shall provide faucets and all lever waste drains, hose reels with mixing valves to the plumbing sub contractor for connection and installation.
- I. The mechanical sub-contractor shall make final connections to equipment shown on Drawings or specified and it shall be the responsibility of the mechanical sub-contractor to provide and install necessary ventilation facilities of sufficient capacity to operate the equipment. Mechanical work to be done by the Food Service Equipment Supplier is listed in the itemized equipment specifications.
- J. The General Contractor shall provide openings and passage ways of sufficient to sustain the weight of the Food Service Equipment Supplier and he shall provide openings and passage ways of sufficient size to permit the delivery and erection of the equipment to their respective locations without dismantling. Coordination of these openings is critical for the equipment installation. The General Contractor shall provide depressed floor for drains grates and walk-in cooler/freezer when noted.

1.5 EXISTING EQUIPMENT

- A. Appropriate trades to disconnect foodservice equipment allocated for relocation or removal.
- B. Foodservice equipment contractor to move and set in place those items indicated as relocated.
- C. Foodservice equipment that is scheduled for removal shall be turned over to the owner for disposal or storage at their discretion.
- D. The data on existing equipment is the best available at the time these drawings were prepared and is offered for planning purposes only. The contractor shall field verify all data prior to roughing-in utilities for existing equipment.
- E. Existing fire suppressions systems shall be reconfigured as required to suit new cooking equipment indicated
- F. Foodservice equipment that is scheduled for reuse shall be tagged, removed, and stored in a location provided by the general contractor on site. Transportation of equipment shall be provided by the contractor.
- G. Verify and document the operating condition of equipment scheduled for reuse prior to its being disconnected. Document the condition of the equipment to note any dents, scratches, broken components, or other damage prior to placing it in storage. Protect equipment during transport and storage, and assume responsibility for its reinstallation in the condition viewed prior to removal. Transport and install the equipment in accordance with item specifications.

- H. The foodservice equipment contractor is not responsible for refurbishing equipment noted as existing on plans or specifications unless work is specifically called for in the written specifications.
- I. All disconnecting and reconnection of services to existing equipment shall be performed by related trades.
- J. The foodservice equipment contractor shall not provide a warranty or guarantee on existing equipment. In the case of a new component being provided by the foodservice equipment contractor for an existing piece of equipment, the component shall be warranteed or guaranteed as specified.

1.6 QUALITY ASSURANCE

- A. The equipment furnished under this section to be supplied by one Kitchen Equipment Company.
- B. Permits and Certificates:
 - 1. All laws, codes, ordinances and regulations bearing on the conduct of the work as drawn and specified shall be complied with and give all notices required. Any work upon which an inspection certificate by local authorities, or any governing body is required, such Inspection Certificate or Certificates shall be obtained and paid.
- C. Certificates of acceptance or of completion as required and issued by the State, Municipal, or other authorities shall be procured and delivered to the Owners. The Owners may withhold payments which are due or which may become due until the necessary Certificates are procured and delivered to Owners.
- D. All safety devices and all accessories required to comply with regulations and governing codes shall be provided, regardless of whether or not specified or called for in the following technical divisions of the equipment list portion of this Section of Specifications.
- E. Applicable Manufacturing Standards:
 - 1. Special fabrication items shall be manufactured in compliance with Standard No. 2 of the National Sanitation Foundation Testing Laboratory, and shall bear the NSF Seal of Approval.
- F. Equipment pieces shall be manufactured in compliance with Standards No. 3, 4, 5, 6, 7, 8, 12, 13, 18, 20, 21, 25, 29, 35, 37, 51, 59 and 61, where applicable, of NSF Testing Laboratories and bear the Seal of Approval. This shall include any pending standards, which shall become applicable at the time equipment is delivered.
- G. Electrical Equipment shall conform to the standards of the National Electrical Manufacturers Association (NEMA). Equipment shall have conveniently located control switches, enclosed case type, comply with State of Alabama Electric Code, and bear the label from an approved Testing Laboratory. (UL or ETL)

- H. Electrically heated and motor driven fixtures shall be for the current shown in the Mechanical and Electrical plans. These items of equipment shall have mounted motor starters, switches and controls. All shall be required for each fixture or complete section of a fixture, or as specified.
- I. Gas burning equipment to be designed for operation with the type of gas furnished, and approved by the American Gas Association. The label or listing of the American Gas Association shall be accepted as conforming to this requirement. Installation of equipment shall conform to the standards as set forth by the American Gas Association, and the National Plumbing Code. Where required, all gas equipment shall be furnished with safety pilot and one hundred percent safety cut-off.
- J. NFPA Codes 13, 17, 17A, and 96 standards shall be complied with for exhaust system. Provide all safety devices on all accessories required to comply with regulation and governing codes.
- K. Miscellaneous Requirements:
 - 1. Plumbing:
 - a. Provide chrome plated faucets specified certified to NSF standard 61, Section 9. All backsplash-mounted faucets shall be provided with double male nipples having locknuts for rigidly securing the faucet to the backsplash. Nipple-locknut assembly shall be provided under this section, as part of the faucet.
 - b. Provide all wastes incorporated in the custom-built fabricated Food Service Equipment. Provide all wastes with chrome-plated tailpiece.
 - 2. Electrical:
 - a. Interwiring of Food Service Equipment between heating elements, switches, starters, thermostats, outlets, motors and solenoid shall be complete to junction box, terminal box or disconnect switch, (should Specifications call for disconnect switch to be provided in this Section).
 - b. Provide grounded receptacles specified under the Item No. of detail Specifications or as shown on the Contract Drawings. All receptacles to be as specified and furnished with stainless steel face plate.
 - c. All electrically operated equipment to be in accordance with the codes, regulations and the laws of the State of Alabama.
 - 3. Safety:
 - a. All Food Service Equipment provided under this Contract shall be manufactured and installed in conformance with the Williams-Steiger Occupational Safety Health Act of 1970.
 - 4. Coordination:
 - a. Coordinate with Project's plumbers and electricians to assist in cutting or knocking out holes in the stainless steel tables, counters and cabinet bases to allow for efficient utility connections to equipment.
- L. Contractor shall be held responsible and liable for any and all changes or variances from Performance Criteria, without written authorization from Architect for said changes or variances.

1.7 REFERENCES

- A. The Drawings indicate the desired basic arrangement and dimensions of the equipment. Minor deviations may be substituted for approval provided basic requirements are met and no major rearrangement of service to the equipment is required to affect the proposed alteration. These deviations shall be made without expense to the Owner.
- B. Operational and functional tests of the installed equipment are required. Defects or deficiencies shall be corrected to the satisfaction of the Architect or Owners at the expense of the Contractor. Consult the Mechanical and Electrical Connections Drawings and they're accompanying Specifications to determine additional requirements of the work, and shall cooperate with all trades to insure a satisfactory installation.
- C. The electrical wiring of motors, motor starters, switches and thermostats of the equipment shall be an integral part of the unit which shall contain a junction box for connection of electrical service. All motor driven equipment shall have thermal overload and underload protection.
- D. Furnish on each motor driven appliance, or electrically heated unit, a suitable mounted control switch or starter of proper type in accordance with UL or ETL Codes. All controls mounted on vertical surfaces of fixtures shall be set into recessed die-stamped stainless steel cups or otherwise indented to prevent damage to control switch.

1.8 SUBMITTALS

- A. Refer to Division 01 requirements for Submittals
- B. FSEC shall verify all field measurements on the job site to insure proper fitting of all equipment. Within four (4) weeks after award of contract, FSEC is to electronically submit PDF format to the Architect, for tentative approval, all dimensioned rough-in drawings, equipment submittal brochures, fabrication and manufacturer's shop drawings.
 - 1. Partial submittals will not be accepted and will be stamped Revise / Resubmit. Reproduction of original contract documents are not acceptable for use as submittal.
- C. After initial review of submittal data, revise and resubmit only the data sheet, coversheets or rough-in and shop drawings that have been modified or revised. The entire submittal is not required for a resubmission. After two resubmissions, the FSEC may be charged a fee for Camacho's continuous re-evaluation. This will be billed as an additional service.
- D. Field Measurements
 - 1. Measurements required to size and place Food Service Equipment are to be verified with on site field dimensions. Do not rely on or measure drawings for actual on site dimensions. Dimensions shall be taken from the actual structure, giving, given due consideration to any architectural, structural or mechanical discrepancies that may occur during construction of building. Field dimensions shall be taken at the earliest opportunity so as not to delay deliveries. Notify Food Service Consultant of the earliest

date and time. FSEC shall be responsible for proper fit of all equipment furnished under this section of the contract. Gaps over ¼"wide are not acceptable.

- E. Rough-In Drawings:
 - 1. Prepare and submit, rough-in drawings showing all utility rough-ins for kitchen equipment items including items listed as "Future, Existing-Relocate, and/or Owner Furnished" (min. scale of 1/4"=1'-0"). Drawings to indicate size and location of all utilities, floor depressions, raised bases and wall openings for equipment. The item numbers shown on the rough-in drawings shall be the same as shown on contract documents. Drawings shall be dimensioned to the stub up or stub out, not to the connection on the equipment. FSEC shall be responsible for conforming to these conditions with equipment and connections thereto. In the event rough-in has been completed before award of contract, the FSEC shall thoroughly investigate and field verify the provided rough-in locations and provide equipment to suit building conditions.
 - 2. Provide equipment floor plan with itemized equipment, to include all utility loads.
 - 3. Electrical rough-in plans are to be dimensioned to indicate above finished floor (AFF) height. 90° plug heads are recommended where available. Verify all NEMA plug types, length of cords, equipment connections lengths. Length are to be of adequate distance for outlets available and to allow equipment to be placed as shown on contract documents. Show convivence receptacle location.
 - 4. Plumbing rough-in plans are to be dimensioned to indicate above finished floor (AFF) height.
 - 5. Ventilation rough-in plans are to be dimensioned and indicate above finished floor (AFF) height.
 - 6. Special conditions plan indicating dimensions and locations of:
 - a. Mechanical plan, not special conditions.
 - b. Raised pads
 - c. Wall openings for pass through equipment
 - d. Floor drains
 - e. Electrical plan, not special conditions
 - f. Wall backing
 - g. Recessed or wall mounted control panels
 - 7. Provide a refrigeration system schematic piping plan indicating line size, elevation, trap locations and all specified components required for the refrigeration system installation. The plan is to include equipment and parts provided by the Refrigeration Equipment Manufacturer. Verify refrigeration sizing is proper for line lengths determined by actual field conditions.
- F. Equipment Cut Sheets:
 - 1. The following instructions for Rough-In and Equipment submittal are in addition to any requirements given elsewhere in the Documents.
 - 2. Prepare and submit, equipment cutsheets showing all manufacturer's data sheets describing equipment as specified. Include items listed as "Future, Existing-Relocate, and/or Owner Furnished". The item numbers shown on the submittal shall be the same as shown on contract documents. The equipment cut sheets are to be provided using Auto Quotes format or similar including coversheets for each item. Where a piece of

equipment is used and specified with multiple item numbers assigned, the first item is to be provided with a cover sheet and data sheet. For additional identical items provide cover sheets only. Provide the following information on the coversheets:

- a. Project name
- b. FSEC name
- c. Foodservice Consultant name
- d. Item Number
- e. Equipment description
- f. Quantity
- g. Written specification/description of equipment provided
- h. Accessories
- i. Utilities
- G. LEED Submittals: Provide product cutsheets noting ENERGY STAR rating for ENERGY STAR eligible equipment.
- H. Shop Drawings
 - 1. Custom stainless steel equipment, walk-in cooler/freezer and refrigeration, exhaust hoods, utility distribution systems, dishwashers, scullery equipment and other shop drawings shall be provided on similar size drawing sheets as contract documents. All shop drawings shall be detailed and fully dimensioned to a minimum scale of ³/₄" = 1'-o". Elevations and sections to be detailed to a minimum scale of 1-1/2" = 1'-o"). Show all materials, gauges and methods of construction, including relation to adjoining and related work when cutting or close fitting is required. Show all reinforcements, wall plates and backing, anchorage, other work required for a complete installation of fixtures. Drawings to show item number and quantity required for each detail. Omissions and discrepancies on approved drawings shall not relieve the FSEC of providing items as specified and shown on contract drawings.
 - 2. Show adjacent walls, columns, and identify countertop equipment showing item numbers and description.
 - 3. Show all components that are included in fabricated equipment.
 - 4. For equipment with load centers (panels), indicate total electrical calculations including circuits. Provide electrical diagram for on site electrician.
 - 5. Provide color, pattern or finishes for laminated, fiberglass, paint, or stain for approval by the Architect/Owner.
- Verify size and weight information of the service ware, (glasses, plates, trays, cups, etc.) for self – leveling dispensing, ware washing and mobile equipment with the Owner. Verify carts, racks, and dollies can fit into fixed equipment (roll-in refrigeration, combi ovens, walk-ins, counters etc.)

1.9 HANDLING AND STORAGE

A. Protect metal and millwork product finishes from damage during shipping, storage, handling, installation and construction of other work in the same spaces. Wrap and crate each item of equipment as needed for protection from damage.

B. Cover exposed stainless steel surfaces and millwork surfaces with self-adhesive protective paper, of a type recommended by the metal and millwork manufacturer; and do not remove until work is installed and ready for cleaning and start-up.

1.10 SCHEDULING

- A. Schedules and Reports:
 - 1. Establish earliest and latest job site delivery dates of FSES provided equipment
- B. Delivery of Owner furnished equipment for installation shall take place at a time to be determined by Owners, but not necessarily during normal working hours.

1.11 SUBSTITUTION

- A. Substitution of Materials and Equipment:
 - 1. Whenever a material, article, or piece of equipment is identified on the Drawings or in the Specifications by reference to manufacturers' or vendors' names, trade name, catalog numbers, or the like, it is so identified for the purpose of establishing a standard. Any material, article, or piece of equipment of other manufacturers or vendors which shall perform adequately the duties imposed by the general design, shall be considered equally acceptable provided, in the opinion of the Architect, it is of comparable substance, construction, appearance and function. It shall not be purchased or installed without Architect's written approval. Substitute items shall be submitted to Architect at least 10 days before bid date for review and consideration. Items that are acceptable shall be so stated in an Addendum.

1.12 WARRANTY

- A. Workmanship and Guarantees:
 - 1. Equipment shall be delivered in an undamaged condition upon completion. All workmanship and labor shall be of the best in their respective fields and skilled mechanics of the trades involved.
- B. All equipment as specified in this Section shall be guaranteed for a period of one year from the time of substantial completion. If, at any time within this warranty period of one year, any equipment that is found to be faulty due to poor workmanship, inferior or defective materials, replace said pieces or correct each defective part at no cost to Owners.
 - 1. Refrigerated items shall have an additional four-year warranty on the compressor unit. On extended compressor warranty, only labor charges after first year shall be paid.
- C. At the end of first year, assign extended warranties to Owners on equipment having more than 1 year warranty from Manufacturer.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Stainless steel shall be austenitic steel alloy, and must meet the requirements of the American Iron and Steel Institute Designations for Type 201 and Type 304 Stainless steel. Type 430 Stainless steel (straight chrome no nickel) shall not be acceptable for custom-built fabricated equipment.
- B. All sheets shall have genuine mill finish of not less than commercial No. 4 on exposed side and with not less than No. 2 on unexposed side. All stainless steel shall be stretcher leveled, with thickness of:
 - 1. 14 Gauge Not less than 0.075 Inch
 - 2. 16 Gauge Not less than 0.063 Inch
 - 3. 18 Gauge Not less than 0.050 Inch
 - 4. 20 Gauge Not less than 0.038 Inch
- C. Welding shall be of electric arc or oxy-acetylene gas. Welding shall be done with rod of same material and full penetration in the entire length of the joint. Welds to be flat without buckles, voids or imperfections. All welds shall be ground flush with adjacent surfaces, conditioned to eliminate dangerous surfaces. All shear cuts or bends that tend to open the surface of the metal shall be rewelded, ground and polished. All edges are to be ground and filed to eliminate sharp or rough edges.
- D. When stainless steel sheets have grain running in different directions, the sheets shall be so jointed and welds run and finished in such a manner as to make the sheets appear as one continuous product.
- E. Gauges:
 - 1. All Gauges of metals, where specified, shall be manufactured to the standards set forth by the U.S. Standard for Sheet Metal.
 - 2. Unless specified, no material shall be finished lighter than 20 gauge for custom-built fabricated equipment.
- F. Sound-Deadening:
 - 1. The undersides of dish tables shall be sound-deadened to no less than 1/8 inch thick and allowed to dry thoroughly before being finished with 2 coats of paint.

2.2 FABRICATION

- A. Products manufactured by Atlanta Custom Fabricator, Low Temp and Titan Fabricator, modified to comply with specifications, are acceptable.
- B. Metal Tops for Tables:
 - 1. Shall be constructed of 14 gauge stainless steel with butt joints welded, ground and polished smooth, resulting in a one piece top without joints and crevices. Tops are to

be reinforced by means of 14 gauge stainless steel channel irons, 1 inch by 5 inches by 1 inch. Securely fastened to underside, on 30 inch centers, by studs or welding in a vermin-proof manner. Free standing ends are to be turned down 1-3/4 inch on bullnose edge or 2 inch rolled down edge with all exposed corners rounded on a 2-1/2 inch radius, or bull-nose corner. Where table borders on or is adjacent to wall, there is to be a 4 inch high backsplash with 1 inch turn back to wall with welded enclosed ends, unless otherwise specified. See Drawings for typical details.

- 2. Sleeves:
 - a. Where legs, standards, pipes, or pipe chases come through a work area or table top, they shall pass through 3 inch high stainless steel sleeves, with the periphery fully welded and polished to match adjacent surfaces.
- C. Cabinet Bases:
 - 1. Tops shall be as otherwise specified for metal tops. Tops to be secured to body by concealed studs welded to underside of top. Studs to pass through holes of body frame and be securely fastened with stainless steel lock washers and nuts. Bases shall be covered back and ends with continuous sheets of 18 gauge stainless steel, folded into front opening. Cabinet shall have 2 shelves, 1 lower and 1 intermediate. All shelves shall be constructed of 16 gauge stainless steel and shall be fixed type. Bases shall be supported on 8 inches high legs NSF approved stainless steel legs with adjustable stainless steel bullet feet.
- D. Sinks:
 - 1. Shall be constructed of 14 gauge stainless steel sheets with all interior corners rounded on at least a 1/2 inch radius. All bottom corners shall be fully coved. All joints to be welded, ground, polished and made to match adjacent surfaces. Provide each sink with a 2 inch chromium plated waste outlet with a stainless steel strainer and Chromium Plated tailpiece. Provide with a rotary lever handle waste valve. Wastes are to be depressed in sink bottoms with bottoms inclining down towards the wastes. Waste for pot sink shall be rotary Model No. B-3940-01, T & S Brass; chrome draining, flat strainer with overflow. Wastes for prep sinks shall be rotary Model No. B-3940, T & S Brass, chrome draining or approved Model by Component Hardware Group, Inc and T & S Brass and Bronze Works. Rotary handle shall have front stainless steel bracket support welded to underside of sink compartment. Backsplash against wall shall be 8 inches high with 2 inch turned back on 45 degree angle with enclosed welded ends. Support sinks on legs and gussets, as specified, with braces from front to rear only. See Drawings for backsplash typical details.
 - 2. All backsplashes against wall shall be sealed with clear Polysulphide Sealant.
 - 3. Each compartment shall have cut-out on rear to accommodate overflow assembly provided with drain assembly. Overflow and drain assemblies shall be installed and made watertight.
- E. Insert Sinks:
 - Shall be sized and shaped as specified with same construction as required for other sinks except that no backsplash is required. The sinks are to be welded into tabletops. All welds are to be ground and polished smooth. Provide with wastes as specified for sinks.

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FOOD SERVICE EQUIPMENT

- F. Drain Tables and Drain Boards:
 - 1. Shall be constructed of 14 gauge stainless steel, size and shape as specified. They are to be made integral with sinks. The front and free ends are to be constructed with a minimum of 3 inches high 1-1/4 inch to 1-1/2 inch rolled rim on an 180 degree turn, unless otherwise specified. Backsplash shall be same height as for sinks, same construction, and integrally welded with sink. Construct drain tables or boards to allow liquids to drain into sinks.
- G. Undershelves:
 - 1. Undershelves are to be constructed in sections of 18 gauge stainless steel and notched out to fit around legs, and be fixed type. Intermediate shelves are to be constructed of 18 gauge stainless steel and be fixed type construction, unless otherwise specified.
- H. Overshelves:
 - 1. Overshelves shall be fabricated of 16 gauge stainless steel with edges rolled down or up and supported as specified.
 - 2. Overshelves mounted on table tops shall be supported by 16 gauge stainless steel tubular legs. Legs are to be securely fastened to table top with fasteners similar to Model No. 1655000272, manufactured by Kason Food Service or approved manufacturer.
- I. Wall Shelves:
 - Wall Shelves shall be fabricated of 16 gauge stainless steel and same construction as "Overshelves". Secure brackets to wall with stainless steel screws with expansion shields. Brackets shall be spaced on a maximum of 4 feet on center.
 - 2. Wall shelves shall be supported on table's extended rear legs with cantilevered supports of 14 gauge stainless steel flag brackets.
- J. Sliding Doors:
 - 1. Sliding Doors: Shall be provided with limit stop fitted with neoprene grommet. Mount doors on ball bearing rollers and supported in aluminum overhead channel tracks or NSF approved lower tracks.
 - 2. Sliding doors shall be Model No. 7318, manufactured by Kason Food Service, and Component Hardware, modified to comply with specifications, are acceptable. Tracks and shelves with nylon surface ball bearing steel wheels.
 - 3. Hinged Doors: All hinged doors shall be double pan construction, 18 gauge stainless steel face, 20 gauge stainless steel rear, unless otherwise specified. Doors shall be a maximum of 1-5/8 inches thick, filled with sound-deadening material. Provide door front with an integral horizontal pull, the full length of the door front.
 - 4. Mount hinged doors on a lift off welded stainless teel hinges Model No. M74-8000, manufactured by Component Hardware. Products manufactured by Kason Food Service, modified to comply with specifications, are acceptable.
 - 5. All corners shall be welded, ground and filed smooth.
- K. Drawers:
 - 1. Lift out type drawer body, 1 piece 20 inches by 20 inches by 5 inches deep, unless otherwise specified. Drawer pan stamped of 20 gauge stainless steel with inside

radiused corners. Construct drawer face of double wall stainless steel, 16 gauge exterior and 20 gauge interior with integral horizontal pull. Fill void in drawer front with sound deadening material. Mount drawer pan in 18 gauge stainless steel cradle with roller bearing slides with stops. When fully extended, drawer to support a minimum 200 pounds. Enclose drawer in 18 gauge stainless steel housing on sides and rear. Design pan carrier to be full opening without tilting. Provide with manual operated release latches to allow drawer removal. Drawer assemblies shall be positive self-closing type.

- L. Legs, Braces, Gussets, Feet:
 - 1. Height of tables and other fabricated items of equipment shall be as specified. Legs shall be of 1-5/8 inch outside diameter, stainless steel 16 gauge tube spaced at intervals of 60".
 - 2. Legs are to be braced by 1-5/8 inch outside diameter stainless steel 16 gauge tube undershelf, welded to legs., 10 inches above the floor. Weld all around periphery at joint to legs and grind smooth. The braces shall be constructed to form rectangular, or "H" frames, and there shall be at least one brace welded to each leg.
 - 3. Gussets shall be stainless steel NSF approved, cylindrical type with setscrew. Leg gussets are to be welded to underside of tables, to reinforcing channels, and underside of sinks. Gussets shall be Model No. A20-0206 manufactured by Component Hardware Group Inc. or comparable stainless steel gussets manufactured by Standard-Keil Hardware Manufacturing Company, United Showcase, Component Hardware and Kason Food Service.
 - 4. Feet shall be stainless steel adjustable bullet shape, fully enclosed, tightly fitting the leg. Provide 1 inch up and down adjustment from the central position, at no time exposing any threads. Adjustments are to be easily made by hand without the use of tools. For counters and cabinet bases, the feet shall be the same as for above. Feet having comparable quality to Component Hardware Group, Inc. and Kason Food Service are approved. Legs for cabinet base shall be 8 inches high, including feet. Freestanding sinks shall be supported on legs and feet as specified, with bracing from front to rear only.
 - 5. Where flanged feet are specified, provide stainless steel flanged feet, which can be securely fastened to floor.

M. Casters:

- 1. Plate Type: Provide stainless steel swivel plate casters. Provide with 5 inch Ply-Loc gray wheels with 1-1/4" tread, zerk grease fittings and seals and a 250 pound capacity. Front casters to have brakes, manufactured by Component Hardware Model No. CMPI-5RPB or equal manufactured by Jarvis Casters or Colson Caster.
- 2. Stem Type: Plate Type: Provide stainless steel swivel plate casters. Provide with 5 inch Ply-Loc gray wheels with 1-1/4" tread, zerk grease fittings and seals and a 250 pound capacity. Front casters to have brakes, manufactured by Component Hardware Model No. CM54-5RPB or equal manufactured by Jarvis Casters or Colson Caster.
- N. Rough Edges:
 - 1. All ends and edges which are rough or sharp shall be filed and ground to a safe smooth finish before delivery to job site.

2.3 MISCELLANEOUS ACCESSORIES

- A. Water Filters:
 - 1. Provide water filters for all ice making, hot and cold beverage equipment and all steam boilers. All filter units are to be provided with shut off valves and quick change filters.
- B. Stainless Steel Enclosures:
 - 1. Provide 20 gauge stainless steel trim to fill in wall openings at Pass-Thru Cabinets. Trim will overlap wall by approximately 2 inches and be within 1/2 inch of cabinets on side. Provide for a 3 inch opening between top of cabinet and wall.

PART 3 - EXECUTION

3.1 DEMONSTRATION AND INSTRUCTION MANUALS

- A. At a time as designated by the Architect or Owners, demonstrate the operation, care, and minor maintenance of equipment supplied. Supply the Architect with an affidavit signed by the Owners or Food Service Manager/Director that this service was rendered and performed.
- B. At the start of operation, devote 1 full working day monitoring all equipment operation. The purpose of this day is to ensure equipment is in proper working order at start.
- C. Coordinate start-up of equipment with testing and balancing of HVAC system. Ensure that HVAC will be operating properly even during maximum equipment use.
- D. Submit to Owners at time of demonstrations 2 complete booklets, in hard binders, containing:
 - 1. Instructions.
 - 2. Warranties.
 - 3. Parts list of all bought out items provided under this section.
 - 4. List of names, addresses and telephone numbers of local authorized servicing agencies.
 - 5. Where available, provide DVD's of all equipment specified. The videos are to show and detail proper care and maintenance of equipment.

3.2 FIELD MEASUREMENTS

A. Field measurements shall be made, giving due consideration to any Architectural, Mechanical, or Structural discrepancies which may occur during the construction of the building. No extra compensation shall be allowed for any difference between actual dimensions secured at the job site and the measurements indicated on the Contract Drawings.

B. Any differences that may be found during field measurements shall be submitted to the Architect for consideration before proceeding with the fabrication or supplying of any equipment.

3.3 INSTALLATION

- A. Dispose of all packaging and debris per Construction Waste Management Plan.
- B. Make arrangements for receiving equipment and make delivery into the building. Do not consign any equipment to the Owners or to any other Contractor unless written acceptance from them and satisfactory arrangements have been made for the payment of freight and all handling charges.
- C. Deliver all equipment into the building, uncrate, assemble, level and repair any damaged or abraded surfaces. Set equipment temporarily in its final locations, permitting the mechanical and electrical trades to take necessary measurement for the connection of the service lines; then move the equipment sufficiently to permit the installation of such service lines. After which realign equipment level and plumb, making the final erection as shown on the Contract Drawings. All equipment shall be installed so as to eliminate objectionable vibration.
- D. Contractor shall have a competent Food Service Equipment foreman on the premises to assist in furnishing information and supervising installation of Food Service Equipment under this section. This foreman shall verify correct locations for Rough-Ins.

3.4 LUBRICATION - OIL AND GREASE

A. Each moving part in the entire food facilities installation shall be provided with suitable bearings with provision for greasing, or with grease gun connections suited to a high-pressure gun for distributing heavy oil or light grease. Points of lubrication shall be readily accessible.

3.5 KITCHEN EQUIPMENT

- A. It is the responsibility of the food service equipment dealer to ensure that any products by manufacturers listed as being acceptable to the prime specification, in fact, meet the design and performance specifications of the prime specification in every way.
- B. The intent of the prime specification is to set forth the level of quality and features/options that are desired by the owner. All features and options of the prime specification must be included with and product substituted from the list of approved manufacturers.
- C. Reference Kitchen Floor Plan for location of equipment. Obtain equipment of like families through same manufacturer. All gas fired equipment must have automatic ignition. These documents are for information purposes only, and are not 100% CD's.

- 1. EXHAUST HOOD
 - a. Existing / Remain
- 2. CONVEYOR OVEN, TOP DECK (2.1 CONVEYOR OVEN, BOTTOM DECK)
 a. Existing
- 3. PIZZA PREPARATION TABLE
 - a. Existing / Relocated
- 4. EQUIPMENT STAND
 - a. Existing / Remain
- 5. SPARE NUMBER
- 6. EXHAUST HOOD a. Existing / Remain
- 7. WORK TABLE
 - a. Existing / Remain
- 8. SERVING COUNTER
 - a. To be Fabricated
 - b. Serving Counter; customer side to mount on fabricated knee wall (utility chase); server side open supported by stainless steel legs; Solid quartz top; Stainless steel construction with stainless steel apron for mounting controls; Load Centers (1 at each end) with pre-wired outlets and connection points.
- 9. HOT FOOD WELL UNIT, DROP-IN
 - a. Delfield Model No. N8759-D*C013
 - b. Drop-In Hot Food Well Unit, Electric, individual pans, wet/dry type with drain & manifold, 4-pan size for 12" x 20" pans, individual infinite temperature controls, stainless steel top & wells, galvanized outer liner, (58-1/2" x 25" cutout required), cUL, UL, NSF.
 - c. Provide with the following:
 - 1) Drain shut off valve.
- 10. SPARE NUMBER
- 11. SPARE NUMBER
- 12. SNEEZE GUARD, STATIONARY WITH HEAT LAMP AND LIGHT
 - a. BSI Model No. ZG9930*C013
 - b. Provide unit with the following:
 - 1) 62"w/HL+33"w/HL.
 - 2) (2) 9930 Adjustable w/ Top Shelf Series End Post(s).
 - a) S/S Post #4 Finish, Brushed.
 - b) Aluminum Bracket Finish
 - c) Center Post(s) S/S Post #4 Finish

- d) Brushed Aluminum Bracket Finish.
- e) 3/8" tempered glass front panels and 3/8" topshelves.
- f) 1/4" tempered glass right end panel.
- g) 1/4" tempered glass left end panel.
- 3) (Item No. 12.1) 24" BSI Stealth Warmer/Light Combo
- 4) (Item No. 12.2) 54" BSI Stealth Warmer/Light Combo
- 5) Decorative housing(s) and with remote infinite control(s).
- 13. HOT / COLD FOOD WELL UNIT, DROP-IN
 - a. Delfield Model No. N8630P*C013
 - b. Drop-In Hot/Cold Food Well, 30-3/4", 2-pan size for 12" x 20" pans, 8" deep single tank with drain, remote control panel with single temperature control & three-way toggle switch, stainless steel top & well, galvanized steel exterior housing, self-contained refrigeration, R290 refrigerant, 1/5 HP, (29-3/4" x 25" cutout required), cUL, UL, NSF
 - c. Provide with the following:
 - 1) Drain shut off valve.
- 14. INDUCTION RANGE WARMER, BUILT-IN / DROP-IN
 - a. Vollrath Model No. 59508DW*C013
 - b. Induction Buffet Warmer, drop-in, 23"W x 16"D x 3-1/16"H, black tempered ceramic glass top, hold only or warming only, touch controls with (4) power levels, LED indicator lights on control panel, over-heat protection, small-article detection, pan auto-detection, empty-pan shut-off, connect up to (3) units together with 30" inter-connect cord & only run one power cord, 60" USB cable for remotely mounted control, 120v/50/60/1-ph, 375W, 3.15 amps, cord with NEMA 5-15P, cULus, NSF, FCC, imported.
- 15. MOBILE HEATED CABINET
 - a. Hatco Model No. FSHC-6W1*C013
 - b. Holding Cabinet, Mobile Heated, thermostatically-controlled heat, electrical components, water reservoir, insulated, (1) door, digital temperature readout, adjustable humidity & temperature, (6) adjustable removable slides for 18" x 26" or 12" x 20" pans, slides on 1-1/2" centers, large swivel casters with wheel locks, NSF, cULus.
 - c. Provide unit with the following:
 - 1) Silver gray side panels.
 - 2) Silver gray top.
- 16. COUNTERTOP FRYER
 - a. Wells Model No. F-15*C013
 - Fryer, electric, countertop, single fry pot, 15 lb. capacity, thermostatic controls,
 (2) half-size baskets, stainless steel fry pot, front, top & sides, 4" adjustable legs, UL, NSF, CSA.
- 17. GRIDDLE, COUNTERTOP
 - a. Wells Model No. G-19*C013
b. Griddle, countertop, electric, smooth polished steel griddle plate, 34-1/4" W x 18-5/16" D cooking surface, stainless steel construction, zoned thermostatic heat control, removable splashguard and 4" adjustable legs, UL, NSF 4, CE, CSA.

18. SNEEZE GUARD, STATIONARY WITH HEAT LAMP AND LIGHT

- a. BSI Model No. ZG9930*C013
- b. Provide unit with the following:
 - 1) 45"w/HL
 - 2) (2) 9930 Adjustable w/ Top Shelf Series End Post(s)
 - a) S/S Post #4 Finish, Brushed.
 - b) Aluminum Bracket Finish.
 - c) 3/8" tempered glass front panels and 3/8" topshelves.
 - d) 1/4" tempered glass right end panel.
 - e) 1/4" tempered glass left end panel.
 - 3) 36" BSI Stealth Warmer/Light Combo.
 - 4) Decorative housing(s) and with remote infinite control(s).
- 19. MOBILE HEATED CABINET
 - a. Hatco Model No. FSHC-6W1*C013
 - b. Holding Cabinet, Mobile Heated, thermostatically-controlled heat, electrical components, water reservoir, insulated, (1) door, digital temperature readout, adjustable humidity & temperature, (6) adjustable removable slides for 18" x 26" or 12" x 20" pans, slides on 1-1/2" centers, large swivel casters with wheel locks, NSF, cULus,.
 - c. Provide unit with the following:
 - 1) Silver gray side panels.
 - 2) Silver gray top.
- 20. SPARE NUMBER
- 21. SPARE NUMBER

22. HEATED SHELF FOOD WARMER

- a. Hatco Model No. GRSBF-60-I*C013
- b. Built In Heated Shelf with Flush Top, 61-1/2" x 21" surface area, hardcoat aluminum top, control thermostat, illuminated on/off switch & mounting bracket, NSF, cUL, UL, UL EPH Classified, CSA.
- c. Provide unit with the following:
 - 1) GRSB-FLUSH-TSTAT Flush mount thermostatic control box with lighted power switch, stainless steel.
 - 2) Stainless Steel Finish.

23. MOBILE EQUIPMENT STAND, REFRIGERATED BASE

- a. Traulsen Model No. TE060HT*C013
- b. Refrigerated Equipment Stand, 60" long, (6) 12" x 20" x 6" deep pan capacity, side by side, (2) drawers, self-contained refrigeration, microprocessor control, stainless steel marine top, stainless steel interior & exterior, 4" casters, microprocessor controls, 1/3 hp, cULus, NSF.

- c. Provide unit with the following:
 - 1) Compressor located on left side, standard.
 - 2) Casters, 6" high, (set of 6).
- 24. SNEEZE GUARD, STATIONARY WITH HEAT LAMP AND LIGHT
 - a. BSI Model No. ZG9930*C013
 - b. Provide unit with the following:
 - 1) 64"w/HL+23"w/HL
 - 2) (2) 9930 Adjustable w/ Top Shelf Series End Post(s):
 - a) S/S Post #4 Finish.
 - b) Brushed Aluminum Bracket Finish.
 - c) Center Post(s) S/S Post #4 Finish, Brushed.
 - d) Aluminum Bracket Finish.
 - e) 3/8" tempered glass front panels and 3/8" topshelves.
 - f) 1/4" tempered glass right end panel.
 - g) 1/4" tempered glass left end panel.
 - 3) (Item No. 24.1) 18" BSI Stealth Warmer.
 - 4) (Item No. 24.2) 60" BSI Stealth Light.
- 25. HOT / COLD FOOD PAN, DROP-IN
 - a. Vollrath Model No. FC-6HC-01208-AD*C013
 - b. Hot/Cold Well, Drop-In, top mount, (1) pan, remote mountable panel with on-off switch, hot/cold toggle with indicator lights for hot or cold, thermostatic temperature rotary knob control in hot mode, preset cold control, automatic drain, 300 series stainless well & flange, galvanized wrapper, 625 watts, 5 amp, 120/208-240v/60/1-ph, cord with NEMA 14-20P, cULus, NSF.
- 26. SOUP WELL, INDUCTION, DROP-IN
 - a. Vollrath Model No. 741101DW*C013
 - b. Induction Warmer, drop-in, dry operation, 11 quart, inset with hinged cover, (4) soup presets, stir indicator LED, solid state controls with locking function, temperature control in °F or °C, cabinet mount controls with leads, includes: induction ready inset, inset cover, mounting hardware & cord with NEMA 5-15P, 250 watts, 2.1 amps, 120v/60/1-ph, cULus, NSF, FCC.
- 27. SOUP WELL, INDUCTION, DROP-IN
 - a. Vollrath Model No. 741101DW*C013
 - b. Induction Warmer, drop-in, dry operation, 11 quart, inset with hinged cover, (4) soup presets, stir indicator LED, solid state controls with locking function, temperature control in °F or °C, cabinet mount controls with leads, includes: induction ready inset, inset cover, mounting hardware & cord with NEMA 5-15P, 250 watts, 2.1 amps, 120v/60/1-ph, cULus, NSF, FCC.
- 28. SNEEZE GUARD WITH LIGHT
 - a. BSI Model No. ZG9930*C013
 - b. Provide unit with the following:
 - 1) 36"w/L.

- 2) (2) 9930 Adjustable w/ Top Shelf Series End Post(s).
 - a) S/S Post #4 Finish, Brushed.
 - b) Aluminum Bracket Finish.
 - c) 3/8" tempered glass front panels and 3/8" topshelves.
 - d) 1/4" tempered glass right end panel.
 - e) 1/4" tempered glass left end panel.
- 3) BSI LED lights, with decorative housing(s) and with remote infinite control(s).
- 29. HAND SINK
 - a. Existing / Remain
- 30. SPARE NUMBER
- 31. SPARE NUMBER
- 32. PASS-THRU REFRIGERATOR a. Existing / Remain
- 33. WORK COUNTER
 - a. To Be Fabricated
 - b. Provide fabricated cabinet base Work Counter, size and shape as shown on Drawings. Provide with bottom and intermediate shelves; Quartz Top; Laminate on Doors
- 34. PASS-THRU HEATED CABINET
 - a. Existing / Remain
- 35. WORTOP REFRIGERATOR
 - a. Existing / Remain
- 36. HAND SINK
 - a. Existing / Remain
- 37. HOT / COLD FOOD WELL UNIT, DROP-IN
 - a. Delfield Model No. N8656P*C013
 - b. Drop-In Hot/Cold Food Well, 56-1/4", 4-pan size for 12" x 20" pans, 8" deep single tank with drain, remote control panel with single temperature control & three-way toggle switch, stainless steel top & well, galvanized steel exterior housing, self-contained refrigeration, R290 refrigerant, 1/4 HP, (55-1/4" x 25" cutout required), cUL, UL, NSF.
 - c. Provide with the following:
 - 1) Drain shut off valve.
- 38. SNEEZE GUARD WITH HEAT LAMP AND LIGHT
 - a. BSI Model No. ZG9930*C013
 - b. Provide unit with the following:
 - 1) 58"w/HL

- 2) (2) 9930 Adjustable w/ Top Shelf Series End Post(s):
 - a) S/S Post #4 Finish, Brushed.
 - b) Aluminum Bracket Finish
 - c) 3/8" tempered glass front panels and 3/8" topshelves.
 - d) 1/4" tempered glass right end panel.
 - e) 1/4" tempered glass left end panel.
- 3) 54" BSI Stealth Warmer/Light Combo, Stealth unit(s).
- 4) Decorative housing(s) and with remote infinite control(s).
- 39. COUNTERTOP GRIDDLE
 - a. Southbend Model No. HDG-48*C013
 - b. Griddle, countertop, gas, 48" W x 24" D cooking surface, 1" thick polished steel plate, thermostatic controls, battery spark ignition, flame failure safety device, stainless steel front, sides & 4" adjustable legs, 120,000 BTU, CSA, NSF.
 - c. Provide unit with the following:
 - 1) Natural Gas.
 - 2) ¾" gas appliance connector complete assembly Model No. HG-4D-48SK-PS-CO13 manufactured by T & S Brass and Bronze. Provide assembly with all free-spin fittings and swivel-link elbow fittings both ends assuring ¾" diameter flow through, quick disconnect/shutoff and safety installation package. As part of this item include Posi-Set alignment system.
- 40. SNEEZE GUARD, VERTICAL
 - a. BSI Model No. ZG9500-4*C013
 - b. Provide unit with the following:
 - 1) 16" x 56" x 16" U shaped.
 - 2) (2) End Post(s).
 - 3) S/S Post
 - 4) #4 Finish
 - 5) Brushed Aluminum Bracket Finish.
 - 6) (2) 9500-4 Adjustable Vertical Partition Series.
 - a) Center Post(s) S/S Post #4.
 - b) Finish, Brushed aluminum bracket finish.
 - c) 3/8" tempered glass front panels.

41. SNEEZE GUARD, VERTICAL

- a. BSI Model No. ZG9500-4*C013
- b. Provide unit with the following:
 - 1) 16" x 66" x 16" -U shaped
 - 2) (2) 9500-4 Adjustable Vertical Partition Series End Post(s).
 - a) S/S Post #4.
 - b) Finish, Brushed Aluminum Bracket Finish
 - c) 3/8" Tempered Glass Front Panels.
- 42. MOBILE EQUIPMENT STAND, REFRIGERATED BASE
 - a. Delfield Model No. F2952CP*C013

- b. Refrigerated Low-Profile Equipment Stand, 52-1/4" W, single-section, (2) drawers (pans not included), stainless steel top & drawer fronts, front non-spill edge, ABS interior sides, 4" casters, side-mounted refrigeration system with electric condensate evaporator, R290 Hydrocarbon refrigerant, 1/5 hp, cUL, UL, NSF.
- 43. EXHAUST HOOD
 - a. Existing / Remain
- 44. MOBILE REACH-IN UNDERCOUNTER FREEZER
 - a. Traulsen Model No. ULT27-R*C013
 - b. Compact Undercounter Freezer, Reach-in, one-section, 27" wide, stainless steel exterior top, sides & door with Santoprene® EZ-Clean Gasket, hinged right, anodized aluminum interior, galvanized exterior back & bottom, rear mounted, self-contained refrigeration, (4) 4" casters, 1/2 hp, cETLus, NSF.
 - c. Provide unit with the following:
 - 1) CK28 Casters, 2-1/2", set of 4.
- 45. MOBILE FRYER WITH FILTER
 - a. Frymaster Model No. FPH155*C013
 - b. High Efficiency Fryer, gas, floor model, 50 lb. capacity, built-in filtration, open frypot design, automatic melt cycle, boil-out temp control, electronic ignition, center mounted RTD, 1° compensating temperature probe, includes: rack-type basket support, basket hanger & twin baskets, stainless steel frypot, door & cabinet, casters, 80,000 BTU, NSF, ENERGY STAR®, Enerlogic®.
 - c. Provide unit with the following:
 - 1) Natural Gas.
 - 2) ³/₄" gas appliance connector complete assembly Model No. HG-4D-48SK-PS-CO13 manufactured by T & S Brass and Bronze. Provide assembly with all free-spin fittings and swivel-link elbow fittings both ends assuring ³/₄" diameter flow through, quick disconnect/shutoff and safety installation package. As part of this item include Posi-Set alignment system.
 - 3) Casters, front two with locking brakes.
- 46. CHARBROILER, COUNTERTOP
 - a. Southbend Model No. HDC-24*C013
 - b. Charbroiler, gas, countertop, 24", cast iron radiants, stainless steel burners, twoposition, two sided cooking grid, removable crumb tray, stainless steel front, sides & 4" adjustable legs, 80,000 BTU, CSA Star, CSA Flame, cCSAus, NSF.
 - c. Provide unit with the following:
 - 1) Natural Gas
 - 2) ¾" gas appliance connector complete assembly Model No. HG-4D-48SK-PS-CO13 manufactured by T & S Brass and Bronze. Provide assembly with all free-spin fittings and swivel-link elbow fittings both ends assuring ¾" diameter flow through, quick disconnect/shutoff and safety installation package. As part of this item include Posi-Set alignment system.

- 47. COUNTERTOP GRIDDLE
 - a. Southbend Model No. HDG-24*C013
 - b. Griddle, countertop, gas, 24" W x 24" D cooking surface, 1" thick polished steel plate, thermostatic controls, battery spark ignition, flame failure safety device, stainless steel front, sides & 4" adjustable legs, 60,000 BTU, CSA, NSF.
 - c. Provide unit with the following:
 - 1) Natural Gas
 - 2) ³⁄₄" gas appliance connector complete assembly Model No. HG-4D-48SK-PS-CO13 manufactured by T & S Brass and Bronze. Provide assembly with all free-spin fittings and swivel-link elbow fittings both ends assuring ³⁄₄" diameter flow through, quick disconnect/shutoff and safety installation package. As part of this item include Posi-Set alignment system.

48. MOBILE EQUIPMENT STAND, REFRIGERATED BASE

- a. Traulsen Model No. TE048HT*C013
- b. Refrigerated Equipment Stand, 48" long, (4) 12" x 20" x 6" deep pan capacity, side by side, (2) drawers, self-contained refrigeration, microprocessor control, stainless steel marine top, stainless steel interior & exterior, 4" casters, microprocessor controls, 1/3 hp, cULus, NSF.
- 49. WORK COUNTER W/ SINK
 - a. To Be Fabricated
 - b. Provide fabricated cabinet base Work Table w/ Sink, size and shape as shown on Drawings. Provide with bottom and intermediate shelves; Quartz Top; Laminate on Doors
- 50. FAUCET
 - a. T&S Brass Model No. B-0221-CR*C013
 - b. Faucet, cerama cartridges, deck mixing faucet, 12" swing nozzle

51. SPARE NUMBER

52. WALL SHELF

- a. To Be Fabricated
- b. Provide fabricated 16-gauge, stainless steel Wall Shelf. Wall Shelf to be size and shape as shown on drawings.
- c. Unit to be mounted and located 24" above the working surface of Item No. 49, Work Counter with Sink.
- d. Shelf sides and rear to flange up 2". Front to have 1-1/2" rolled down edge. Support Shelf on wall by heavy gauge stainless steel brackets or by approved alternate means.

53. COUNTERTOP DUMP STATION

- a. Hatco Model No. GRFFL*C013
- b. Display Food Warmer, countertop, 12-3/8" W, metal sheathed element, incandescent light, NSF, cULus.
- c. Provide unit with the following:

- 1) D Clear Anodized Aluminum.
- 54. CONVEYOR TOASTER
 - a. Hatco Model No. TQ-10*C013
 - b. Conveyor Toaster, horizontal conveyor, countertop design, all bread types toaster, approximately 5 slices/min capacity, 2" opening height, 4" legs, cULus, UL EPH Classified.
- 55. HOT DOG ROLLER
 - a. Nemco Food Equipment Model No. 8010*C013
 - b. Hot Dog Grill, roller-type, (6) chrome rollers, (10) hot dogs capacity, (200) per hour, aluminum and stainless steel construction, (1) switch, (7) heat control settings each, (1) motor, 330 watts, NEMA 5-15P, 120v, 2.8 amps, NSF, cETLus
 - c. Provide unit with the following:
 - 1) 8024-BW Bun/Food Warmer, 15.75"W x 11"D, stackable, non-steam, 24 bun capacity, stainless steel flip door, stainless steel construction, 120v/60/1ph, 20 watts, 0.17 amps, 6' cord, NEMA 5-15P NSF, ETL
 - 2) 8010GD Roll-A-Guard® Sanitary Sneeze Guard, standard/self serve, acrylic, clear.
- 56. MOBILE HEATED CABINET
 - a. Hatco Model No. FSHC-6W1*C013
 - b. Holding Cabinet, Mobile Heated, thermostatically-controlled heat, electrical components, water reservoir, insulated, (1) door, digital temperature readout, adjustable humidity & temperature, (6) adjustable removable slides for 18" x 26" or 12" x 20" pans, slides on 1-1/2" centers, large swivel casters with wheel locks, NSF, cULus.
 - c. Provide unit with the following:
 - 1) SILVER Silver gray side panels.
 - 2) SILVER Silver gray top.
- 57. HAND SINK
 - a. Existing / Remain

58. MOBILE UNDERCOUNTER REFRIGERATOR

- a. Traulsen Model No. TU044HT*C013
- b. Undercounter Refrigerator, reach-in, one-section, 9.8 cu ft., side mount selfcontained refrigeration, (1) solid hinged door, (2) wire shelves, microprocessor control with LED display, stainless steel interior, front & sides, galvanized top, back & bottom non-flammable R-450A refrigerant, 1/3 HP, cULus, NSF
- c. Provide unit with the following:
 - 1) Casters, 3" high, (set of 4.)
- 59. HEATED SHELF, DROP-IN
 - a. Hatco Model No. GRSBF-48-I*C013

- b. Built In Heated Shelf with Flush Top, 49-1/2" x 21" surface area, hardcoat aluminum top, control thermostat, illuminated on/off switch & mounting bracket, NSF, cUL, UL, UL EPH Classified, CSA.
- c. Provide unit with the following:
 - 1) GRSB-FLUSH-TSTAT Flush mount thermostatic control box with lighted power switch, stainless steel.
 - 2) Stainless Steel Finish, standard.
- 60. SPARE NUMBER
- 61. SPARE NUMBER
- 62. SNEEZE GUARD WITH HEAT LAMP AND LIGHT
 - a. BSI Model No. ZG9930*C013
 - b. Provide unit with the following:
 - 1) 52"w/HL
 - 2) (2) 9930 Adjustable w/ Top Shelf Series End Post(s)
 - a) S/S Post #4 Finish, Brushed
 - b) Aluminum Bracket Finish.
 - c) 3/8" tempered glass front panels and 3/8" topshelves.
 - d) 1/4" tempered glass RIGHT end panel.
 - e) 1/4" tempered glass LEFT end panel.
 - 3) 48" BSI Stealth Warmer/Light Combo, Stealth unit(s)
 - 4) Decorative housing(s) and remote infinite control(s).
- 63. HOT / COLD FOOD WELL UNIT, DROP-IN
 - a. Delfield Model No. N8656P*C013
 - b. Drop-In Hot/Cold Food Well, 56-1/4", 4-pan size for 12" x 20" pans, 8" deep single tank with drain, remote control panel with single temperature control & three-way toggle switch, stainless steel top & well, galvanized steel exterior housing, self-contained refrigeration, R290 refrigerant, 1/4 HP, (55-1/4" x 25" cutout required), cUL, UL, NSF.
 - c. Provide with the following:
 - 1) Drain shut off valve.

64. SNEEZE GUARD, WITH HEAT LAMP AND LIGHT

- a. BSI Model No. ZG9930*C013
- b. Provide unit with the following:
 - 1) 60"w/HL
 - 2) (2) 9930 Adjustable w/ Top Shelf Series End Post(s)
 - a) S/S Post #4 Finish.
 - b) Brushed ALUMINUM Bracket Finish.
 - c) 3/8" tempered glass front panels and 3/8" topshelves.
 - d) 1/4" tempered glass right end panel.
 - e) 1/4" tempered glass left end panel.
 - 3) 54" BSI Stealth Warmer/Light Combo, Stealth.
 - 4) Decorative housing(s) and remote infinite control(s).

- 65. AMBIENT DISPLAY CASE
 - a. Federal Industries Model No. ITD3626*C013
 - b. Non-Refrigerated Display Case, counter display model, 36"W x 30"D x 26"H, 2tiers adjustable glass shelves, tempered tilt-out straight front glass, tempered glass top, ends & doors, removable sliding rear doors, LED top light & shelf lights, steel base construction, stainless steel interior, gray textured exterior, UL, UL EPH CLASSIFIED.
 - c. Provide unit with the following:
 - 1) Standard glass ends.
- 66. FLAVOR STATION
 - a. To be Fabricated
 - b. Provide fabricated cabinet base Flavor Station, size and shape as shown on drawings. Provide with bottom and intermediate shelves; Quartz Top; Laminate on Doors; Stainless steel construction
- 67. HOT FOOD WELL UNIT, DROP-IN
 - a. Delfield Model No. N8717-D*C013
 - b. Drop-In Hot Food Well Unit, Electric, individual pans, wet/dry type with drain & manifold, 1-pan size for 12" x 20" pan, individual infinite temperature controls, stainless steel top & wells, galvanized outer liner (16-7/8" x 25" cutout required).
 - c. Provide with the following:
 - 1) Drain shut off valve.
- 68. COLD FOOD PAN, DROP-IN
 - a. Delfield Model No. N8118BP*C013
 - b. Drop-In Mechanically Cooled Pan, 18"W x 26" D, 1-pan size, 1" dia. drain, insulated pan, stainless steel inner liner & top, galvanized steel outer liner, includes adapter bars, self-contained refrigeration, R290 Hydrocarbon refrigerant, 1/6 hp, (17" x 25" cutout required), cUL, UL, NSF 7.
 - c. Provide with the following:
 - 1) Drain shut off valve.
- 69. SNEEZE GUARD WITH LIGHT
 - a. BSI Model No. ZG9930*C013
 - b. Provide unit with the following:
 - 1) 42"w/L.
 - 2) (2) 9930 Adjustable w/ Top Shelf Series End Post(s).
 - a) S/S Post #4 Finish, Brushed.
 - b) Aluminum Bracket Finish.
 - c) 3/8" tempered glass front panels and 3/8" topshelves.
 - d) 1/4" tempered glass right end panel.
 - e) 1/4" tempered glass left end panel.
 - 3) (Item No. 69.1) BSI LED lights installed in a slim-line housing
- 70. BEVERAGE TABLE
 - a. To Be Fabricated

- b. Provide fabricated stainless steel Beverage Table w/ Laminated hinged doors, size and shape as shown on Drawings; Quartz top; Table to be provided with undershelf; Cabinet base; Stainless steel construction
- 71. BEVERAGE ICE AND SODA DISPENSER, COUNTER
 - a. By Product Supplier.
- 72. ICE MAKER
 - a. Existing / Remain
- 73. JUICE DISPENSER, COUNTER TOPa. By Product Supplier.
- 74. BEVERAGE ICE AND SODA DISPENSER, COUNTER TOPa. By Product Supplier.
- 75. JUICE DISPENSER, COUNTER TOP
 - a. By Product Supplier.
- 76. BEVERAGE ICE AND SODA DISPENSER, COUNTER TOPa. By Product Supplier
- 77. ICE MAKER
 - a. Existing / Remain
- 78. DELI/SALAD VEGAN COUNTER
 - a. To Be Fabricated
 - b. Serving Counter; Full cabinet construction per details and specifications; Solid quartz top; laminate front; Stainless steel construction; Load center with prewired outlets and connection points.
- 79. DROP-IN COLD FOOD WELL UNIT
 - a. Delfield Model No. N8169BP*C013
 - Drop-In Mechanically Cooled Pan, 69" W x 26" D, 5-pan size, 8" deep, 1" dia. drain, insulated pan, stainless steel inner liner & top, galvanized steel outer liner, includes adapter bars, self-contained refrigeration, R290 Hydrocarbon refrigerant, 2/7 hp, (68" x 25" cutout required), cUL, UL, NSF 7
 - c. Provide unit with the following:
 - 1) AS000-473-003W Remote toggle switch assembly, shipped loose.
 - 2) Drain shut off valve.
- 80. SPARE NUMBER
- 81. SPARE NUMBER
- 82. SNEEZE GUARD, STATIONARY
 - a. BSI Model No. ZG9930*C013
 - b. Provide unit with the following:

- 1) 36.5"w/L+36.5"w/L
- 2) (2) 9930 Adjustable w/ Top Shelf Series
 - a) End Post(s) S/S Post #4 Finish
 - b) Brushed Aluminum Bracket Finish
- 3) 9915 Adjustable Cantilevered w/ Top Shelf Series
- 4) End Post(s) S/S Post #4 Finish.
- 5) Brushed Aluminum Bracket Finish
- 6) Clear Span series with 1" horizontal tubing to support a floating center post.
- 7) 3/8" tempered glass front panels and 3/8" topshelves.
- 8) (1) 1/4" tempered glass RIGHT end panel
- 9) (1) 1/4" tempered glass LEFT end panel
- 10) BSI LED lights installed in a slim-line housing
- 83. SOUP WELL, DROP-IN INDUCTION
 - a. Vollrath Model No. 741101DW*C013
 - b. Induction Warmer, drop-in, dry operation, 11 quart, inset with hinged cover, (4) soup presets, stir indicator LED, solid state controls with locking function, temperature control in °F or °C, cabinet mount controls with leads, includes: induction ready inset, inset cover, mounting hardware & cord with NEMA 5-15P, 250 watts, 2.1 amps, 120v/60/1-ph, cULus, NSF, FCC.
- 84. SOUP WELL, DROP-IN INDUCTION
 - a. Vollrath Model No. 741101DW*C013
 - b. Induction Warmer, drop-in, dry operation, 11 quart, inset with hinged cover, (4) soup presets, stir indicator LED, solid state controls with locking function, temperature control in °F or °C, cabinet mount controls with leads, includes: induction ready inset, inset cover, mounting hardware & cord with NEMA 5-15P, 250 watts, 2.1 amps, 120v/60/1-ph, cULus, NSF, FCC.
- 85. SNEEZE GUARD WITH HEAT LAMP AND LIGHT
 - a. BSI Model No. ZG9930*C013
 - b. Provide unit with the following:
 - 1) 37"w/L+38"w/HL.
 - 2) (2) 9930 Adjustable w/ Top Shelf Series End Post(s).
 - 3) S/S Post #4 Finish.
 - 4) Brushed Aluminum Bracket Finish.
 - 5) 9930 Adjustable w/ Top Shelf Series Center Post(s).
 - 6) S/S Post #4 Finish
 - 7) Brushed Aluminum Bracket Finish.
 - 8) 3/8" tempered glass front panels and 3/8" topshelves.
 - 9) 1/4" tempered glass right end panel.
 - 10) 1/4" tempered glass left end panel.
 - 11) (Item No. 85.1) 30" BSI Stealth Warmer/Light Combo, Stealth unit(s).
 - 12) (Item No. 85.2) BSI LED lights
 - 13) Decorative housing(s) and remote infinite control(s).

- 86. HOT / COLD FOOD WELL UNIT, DROP-IN
 - a. Delfield Model No. N8630P*C013
 - b. Drop-In Hot/Cold Food Well, 30-3/4", 2-pan size for 12" x 20" pans, 8" deep single tank with drain, remote control panel with single temperature control & three-way toggle switch, stainless steel top & well, galvanized steel exterior housing, self-contained refrigeration, R290 refrigerant, 1/5 HP, (29-3/4" x 25" cutout required), cUL, UL, NSF.
 - c. Provide with the following:
 - 1) Drain shut off valve.
- 87. COLD FOOD WELL UNIT, DROP-IN
 - a. Delfield Model No. N8156BP*C013
 - b. Drop-In Mechanically Cooled Pan, 56-1/4" W x 26" D, 4-pan size, 1" dia. drain, insulated pan, stainless steel inner liner & top, galvanized steel outer liner, includes adapter bars, self-contained refrigeration, R290 Hydrocarbon refrigerant, 2/7 hp, (55-1/4" x 25" cutout required), cUL, UL, NSF 7.
 - c. Provide with the following:
 - 1) Drain shut off valve.
- 88. SNEEZE GUARD WITH LIGHT
 - a. BSI Model No. ZG9930*C013
 - 1) 60"w/L.
 - 2) (2) 9930 Adjustable w/ Top Shelf Series.
 - 3) End Post(s) S/S Post.
 - 4) #4 Finish.
 - 5) Brushed Aluminum Bracket Finish.
 - 6) 3/8" tempered glass front panels and 3/8" topshelves.
 - 7) 1/4" tempered glass RIGHT end panel.
 - 8) 1/4" tempered glass LEFT end panel.
 - 9) BSI LED lights installed in a slim-line housing.
- 89. MOBILE UNDERCOUNTER REFRIGERATOR
 - a. Traulsen Model No. TU044HT*C013
 - b. Undercounter Refrigerator, reach-in, one-section, 9.8 cu ft., side mount selfcontained refrigeration, (1) solid hinged door, (2) wire shelves, microprocessor control with LED display, stainless steel interior, front & sides, galvanized top, back & bottom, non-flammable R-450A refrigerant, 1/3 HP, cULus, NSF
 - c. Provide unit with the following:
 - 1) Casters, 3" high, (set of 4)
- 90. COLD FOOD WELL UNIT, DROP-IN
 - a. Delfield Model No. N8169BP*C013
 - Drop-In Mechanically Cooled Pan, 69" W x 26" D, 5-pan size, 8" deep, 1" dia. drain, insulated pan, stainless steel inner liner & top, galvanized steel outer liner, includes adapter bars, self-contained refrigeration, R290 Hydrocarbon refrigerant, 2/7 hp, (68" x 25" cutout required), cUL, UL, NSF 7.
 - c. Provide with the following:

- 1) Drain shut off valve.
- 91. SNEEZE GUARD, STATIONARY
 - a. BSI Model No. ZG9930*C013
 - b. Provide unit with the following:
 - 1) 37.5"w/L+37.5"w/L.
 - 2) (2) 9930 Adjustable w/ Top Shelf Series.
 - 3) End Post(s) S/S Post.
 - 4) #4 Finish, Brushed Aluminum Bracket Finish.
 - 5) 9915 Adjustable Cantilevered w/ Top Shelf Series.
 - 6) End Post(s).
 - 7) S/S Post.
 - 8) #4 Finish, Brushed Aluminum Bracket Finish.
 - 9) Clear Span series shall use 1" horizontal tubing to support a floating center post.
 - 10) 3/8" tempered glass front panels and 3/8" topshelves.
 - 11) 1/4" tempered glass right end panel.
 - 12) 1/4" tempered glass left end panel.
 - 13) BSI LED lights installed in a slim-line housing.
- 92. COLD PAN UNIT, DROP-IN
 - a. Delfield Model No. N8156BP*C013
 - b. Drop-In Mechanically Cooled Pan, 56-1/4" W x 26" D, 4-pan size, 1" dia. drain, insulated pan, stainless steel inner liner & top, galvanized steel outer liner, includes adapter bars, self-contained refrigeration, R290 Hydrocarbon refrigerant, 2/7 hp, (55-1/4" x 25" cutout required), cUL, UL, NSF 7.
 - c. Provide with the following:
 - 1) Drain shut off valve.
- 93. SNEEZE GUARD WITH LIGHT
 - a. BSI Model No. ZG9930*C013
 - b. Provide unit with the following:
 - 1) 60"w/L.
 - 2) (2) 9930 Adjustable w/ Top Shelf Series.
 - 3) End Post(s) S/S Post #4 Finish, Brushed.
 - 4) Aluminum Bracket Finish.
 - 5) 3/8" tempered glass front panels and 3/8" topshelves.
 - 6) 1/4" tempered glass RIGHT end panel.
 - 7) 1/4" tempered glass LEFT end panel.
 - 8) BSI LED lights installed in a slim-line housing.
- 94. HOT / COLD FOOD PAN, DROP-IN
 - a. Delfield Model No. N8630P*C013
 - b. Drop-In Hot/Cold Food Well, 30-3/4", 2-pan size for 12" x 20" pans, 8" deep single tank with drain, remote control panel with single temperature control & three-way toggle switch, stainless steel top & well, galvanized steel exterior housing,

self-contained refrigeration, R290 refrigerant, 1/5 HP, (29-3/4" x 25" cutout required), cUL, UL, NSF.

- c. Provide with the following:
 - 1) Drain shut off valve.

95. SNEEZE GUARD WITH HEAT LAMP AND LIGHT

- a. BSI Model No. ZG9930*C013
- b. Provide unit with the following:
 - 1) 37"w/HL.
 - 2) (2) 9930 Adjustable w/ Top Shelf Series:
 - a) End Post(s) S/S Post #4 Finish.
 - b) Brushed Aluminum Bracket Finish
 - c) 3/8" tempered glass front panels and 3/8" topshelves.
 - d) (1) 1/4" tempered glass right end panel.
 - e) 1/4" tempered glass left end panel.
 - 3) (Item No.95.1) 30" BSI Stealth Warmer/Light Combo.
 - 4) (Item No. 95.1) BSI LED lights, Warmer(s) are 120V, with decorative housing(s) and remote infinite control(s.)
- 96. SNEEZE GUARD, VERTICAL
 - a. BSI Model No. ZG9500-4*C013
 - b. Provide unit with the following:
 - 1) 16" x 38"+48" x 16" -U shaped.
 - 2) (2) 9500-4 Adjustable Vertical Partition Series:
 - a) End Post(s) S/S Post.
 - b) #4 Finish.
 - c) Brushed Aluminum Bracket Finish.
 - 3) (3) 9500-4 Adjustable Vertical Partition Series:
 - a) Center Post(s)
 - b) S/S Post
 - c) #4 Finish.
 - d) Brushed Aluminum Bracket Finish
 - e) 3/8" Tempered Glass Front Panels.

97. CONVEYOR OVEN

- a. Lincoln Impinger Model No. 2501/1353*C013
- b. Countertop Oven, electric, single-deck, with standard 31" conveyor, digital controls, 208v/60/1-ph, 27.0 amps, 3 wires, 6.0kW, cULus, UL EPH.
- 98. INDUCTION WARMER, DROP-IN
 - a. Vollrath Model No. 5950145*C013
 - b. Drop-In Induction Warmer, 12-1/2"W x 14-1/2"D x 2-7/8"H, 14" max pan size, 1-5 power level adjustment, 1-180 minute timer function, LED digital readout, 120v/60/1-ph, 450 Watts, 3.8 amps, cord with NEMA 5-15P, cULus, NSF, FCC, imported.
- 99. HOT / COLD PAN, DROP-IN

- a. Delfield Model No. N8630P*C013
- b. Drop-In Hot/Cold Food Well, 30-3/4", 2-pan size for 12" x 20" pans, 8" deep single tank with drain, remote control panel with single temperature control & three-way toggle switch, stainless steel top & well, galvanized steel exterior housing, self-contained refrigeration, R290 refrigerant, 1/5 HP, (29-3/4" x 25" cutout required), cUL, UL, NSF.
- c. Provide with the following:
 - 1) Drain shut off valve.
- 100. MOBILE HEATED CABINET
 - a. Hatco Model No. FSHC-6W1*C013
 - b. Holding Cabinet, Mobile Heated, thermostatically-controlled heat, electrical components, water reservoir, insulated, (1) door, digital temperature readout, adjustable humidity & temperature, (6) adjustable removable slides for 18" x 26" or 12" x 20" pans, slides on 1-1/2" centers, large swivel casters with wheel locks, NSF, cULus.
 - c. Provide unit with the following:
 - 1) Silver gray side panels.
 - 2) Silver gray top.
- 101. SPARE NUMBER

102. SNEEZE GUARD WITH HEAT LAMP AND LIGHT

- a. BSI Model No. ZG9930*C013
- b. Provide unit with the following:
- c. 37"---
- d. (2) 9930 Adjustable w/ Top Shelf Series
- e. End Post(s) S/S Post #4 Finish, Brushed ALUMINUM
 - 1) Bracket Finish
 - a) 3/8" tempered glass front panels and 3/8" topshelves
 - b) 1/4" tempered glass RIGHT end panel
 - c) , (1) 1/4" tempered glass LEFT end panel
 - 2) 30" BSI Stealth Warmer/Light Combo, Stealth unit(s).
 - 3) Decorative housing(s) and remote infinite control(s).
- 103. DROP-IN PREP SINK
 - a. To Be Fabricated
 - b. Drop-In Prep Sink; Size & Shape per plan and details
- 103.1 FAUCET
 - c. T&S Brass Model No. B-0221-CR*C013
 - d. Faucet, ceramic cartridges, deck mixing faucet, 12" swing.
- 104. MOBILE REACH-IN REFRIGERATOR
 - a. Delfield Model No. GBR1P-GH*C013
 - b. Reach-In Refrigerator, one-section, 27.4" W, 21.0 cubic feet, self-contained refrigeration, (2) half-height glass doors, LED interior lighting, digital

temperature display/controls, (3) epoxy coated wire shelves, pilaster with shelf clips, stainless steel front & sides, aluminum back & interior, top mount refrigeration system, GreenGenius[™] R290 Hydrocarbon refrigerant, 5" casters, 115v/60/1-ph, 4.2 amps, 1/5 HP, NEMA 5-15P, UL, NSF, ENERGY STAR[®].

- 105. MOBILE REACH-IN REFRIGERATOR
 - a. Delfield Model No. GBR1P-GH*C013
 - b. Reach-In Refrigerator, one-section, 27.4" W, 21.0 cubic feet, self-contained refrigeration, (2) half-height glass doors, LED interior lighting, digital temperature display/controls, (3) epoxy coated wire shelves, pilaster with shelf clips, stainless steel front & sides, aluminum back & interior, top mount refrigeration system, GreenGenius[™] R290 Hydrocarbon refrigerant, 5" casters, 115v/60/1-ph, 4.2 amps, 1/5 HP, NEMA 5-15P, UL, NSF, ENERGY STAR[®].

106. MOBILE REACH-IN HEATED CABINET

- a. Delfield Model No. GAH1-SH*C013
- b. Heated Cabinet, Reach-In, one-section, 21.0 cubic feet capacity, (2) half-height hinged solid door (locking), (3) adjustable chrome wire shelves, 4.3" easyTouch® screen temperature display/control with remote monitoring, incandescent interior lighting, stainless steel exterior front, sides & interior, (4) 5" locking casters, 208-240v/60/1-ph, 6.0 amps, NEMA 6-20P, NSF, cULus, ENERGY STAR®.
- c. Provide unit with the following:
 - 1) Door hinged on left
- 107. HAND SINK
 - a. Existing / Remain
- 108. ISLAND SERVICE COUNTER
 - a. To Be Fabricated
 - b. Island Service Counter; Full cabinet construction rep details and specifications; Solid quartz top; laminate front; Stainless steel construction
- 109. SPARE NUMBER
- 110. SPARE NUMBER

111. COUNTER-MOUNTED OVERSHELF

- a. To Be Fabricated
- b. Counter-mounted Overshelf; Per details and specifications
- 112. PANINI GRILL
 - a. Equipex Model No. MAJESTIC*C013
 - Panini Grill, cast iron grooved top & grooved bottom griddle plates, 21"W x 9-1/2"D grill area, (2) independent adjustable spring counterbalanced tops, front drip tray & scraper, grills with stainless steel construction, 570°F thermostatic controls, 208/240v/60/1-ph, 16.0/18.0 amps, 4.0kW, NEMA L6-30P, cULus, cULus Classified.

113. MICROWAVE/IMPINGEMENT OVEN

- a. Turbo Chef Model No. I5*Co13
- b. Microwave/Impingement Oven, Rapid Cook, electric, 28.1" wide, ventless, countertop, fully insulated cook chamber, stores up to 200 recipes, internal catalytic converter, smart voltage sensor technology (US only), digital display, removable rack and grease collection pan, top and bottom jet plates, pull down door with ergonomic handle, multi-speed impingement blower, 13 1/2" x 14 1/4, (2) solid PTFE baskets, (1) oven cleaner (1) oven guard, (1) aluminum paddle, (2) trigger sprayers, (1) standard rack, side hand grips, stainless steel front, top & sides, cULus, CE, UL EPH Classified, ANSI/NSF 4, TUV

114. MOBILE UNDERCOUNTER REFRIGERATOR

- a. True Manufacturing Co., Inc. Model No. TUC-60-LP-HC*C013
- Low Profile Undercounter Refrigerator, 31-7/8" counter height, 33 38°F, (2) stainless steel doors, (4) PVC coated adjustable wire shelves, aluminum interior with stainless steel floor, stainless steel top & sides, 1-1/2" dual swivel castors, R290 Hydrocarbon refrigerant, 1/4 HP, 115v/60/1-ph, 4.0 amps, NEMA 5-15P, cULus, UL EPH Classified.
- 115. DISPENSER, DRY
 - a. Rosseto Model No. EZ563*C013
 - b. Dispenser, table top, (6) 1.3 gallon capacity cylinders, 20-7/8" x 20-7/8" x 27-1/2"H, container carousel, dispenses 1 oz. portions, with patented silicone dispensing wheel, stainless steel stand, removable catch trays, (6) label holders
- 116. MILK DISPENSER
 - a. Existing / Relocate
- 117. WAFFLE BATTER DISPENSER
 - a. By Product Supplier
- 118. WAFFLE BAKER a. By Product Supplier
- 119. SYUP WARMER a. By Product Supplier
- 120. SPARE NUMBER
- 121. SPARE NUMBER
- 122. CUP DISPLAY
 - a. By Product Supplier
- 123. COFFEE BREWER

- a. Existing / Relocate
- 124. CONDIMENT ORGANIZER a. By Product Supplier
- 125. BEVERAGE & ICE DISPENSER
 - a. By Product Supplier
- 126. ICE MAKER, CUBE-STYLE
 - a. Scotsman Model No. C0522MA-1*C013
 - b. Ice Maker, cube style, air-cooled, self-contained condenser, production capacity up to 475 lb/24 hours at 70°/50° (340 lb AHRI certified at 90°/70°), stainless steel finish, medium cube size, 115v/60/1-ph, 13.5 amps, cULus, NSF, CE

127. BREAKFAST / BEVERAGE COUNTER

- a. To Be Fabricated
- b. Provide fabricated Counter w/ hinged doors, size and shape as shown on Drawings; Solid Quartz top; laminate front w/ laminate doors; Counter to be provided with undershelf; Stainless steel construction
- 128. SPARE NUMBER
- 129. SPARE NUMBER
- 130. CASHIER'S COUNTER
 - a. By Millwork
- 131. POINT OF SALE
 - a. By Owner

132. TRASH / RECYCLING COUNTER

- a. To Be Fabricated
- b. Trash / Recycling Counter; Size & shape per plans; Stainless steel top; Laminate doors; Stainless steel construction
- 133. SPARE NUMBER
- 134. STAINLESS STEEL WALL PANELS
 - a. Provide fabricated, 20-gauge Stainless Steel Wall Flashing, 304 series No.3 finish. All panels to be 48" wide with a vertical grain. Panels will extend from immediately above finished floor coved base and shall extend to 6" above bottom of hood. Provide bottom horizontal edge of panel with a 1" @ 45 degree bend to overlap the floor cove base. Where all vertical panel joints occur, provide stainless steel trim strip with hidden fasteners. All panels to be sealed to wall and held in place at edges w/stainless steel screws.

- b. Seal all crevices with clear polysulfide sealant.
- 135. SOILED DISHTABLE
 - a. To Be Fabricated
 - b. Provide fabricated, stainless steel, Soiled Dish Table, size and shape as shown on Drawings. Verify height and set up table to allow liquids to flow into pre-rinse sink or dishwasher.
 - c. Provide unit with the following:
 - 1) Where shown on Drawings, provide cut out to accommodate Item No.136, Collector.
 - 2) Provide scrapping trough size and shape as shown on plan and details
 - d. Provide Soiled Dish Table with an 8" high backsplash where table is against wall. Seal table to wall. On operator's side of Soiled Dish Table, provide a 3" high raised rim with rolled edge
- 136. WASTE COLLECTOR
 - a. Salvajor Model No. S419*C013
 - b. Trough Collector, trough conveyor & collecting system (widely accepted in areas where disposers are restricted), HYDROLOGIC® with LCD readout, trough diffuser, salvage basin & silverware trap, scrap basket, 3/4 HP corrosion-resistant pump, pump intake screen ,stainless steel construction, start/stop pushbutton control panel, with safety line disconnect & automatic shut off timer, UL, CSA, CE, NSF.
 - c. Provide unit with the following:
 - 1) Collector top
 - 2) 419CISS Trough Collector[™] full stainless steel cover
 - 3) 2 ea 988001 Gusher head assembly
- 137. HOSE REEL
 - a. T&S Brass Model No. B-7242-C08H*C013
 - b. Hose Reel System, enclosed, epoxy coated steel, 3/8" x 50 ft. hose, with JeTSpray high flow valve
 - oRK2 Shut-Off Control Valve, 6" long, adjustable wall flange, polished chrome cross handle, blue index, includes: (2) bushings 1/2" male x 3/8" female NPT, rough brass body, 1/2" female NPT, ADA compliant, ANSI, NSF
 - 2) B-CVH1-2 Check Valve, 1/2" NPT female, horizontal
 - 3) B-0512 Concealed Mixing Faucet, 4-arm handles, 3/8" NPT inlets & outlets, 3" centers
- 138. DISHWASHER, CONVEYOR TYPE
 - a. Lease
- 139. DUCT RISER
 - a. To Be Fabricated
 - b. Provide fabricated Exhaust Duct Riser, size and shape as shown on Drawings.
 - c. Provide a fabricated, 16-gauge stainless steel sleeve. Attach sleeve to duct at ceiling penetrations.

140. CLEAN DISHTABLE

- a. To Be Fabricated
- b. Provide fabricated, stainless steel Clean Dishtable, size and shape as shown on drawings. Set table height to allow racks to move freely from Dishwasher onto table. Reference Drawings for elevation Details.
- c. Mount limit switch provided with Dishwasher in the backsplash on table side directly opposite exit side of Dishwasher. Secure wiring for limit switch to the underside of table top. Provide enclosed end splash that matches backsplash construction
- d. Where table is adjacent to wall, provide 8" high backsplash with welded enclosed ends. Provide front and end opposite of Dishwasher with 3" raised rolled rim.
- e. Provide fabricated 16-gauge, stainless steel Wall Shelf. Wall Shelf to be size and shape as shown on drawings.
- f. Unit to be mounted and located 24" above the working surface of dish table.
- g. Shelf sides and rear to flange up 2". Front to have 1-1/2" rolled down edge. Support Shelf on wall by heavy gauge stainless steel brackets or by approved alternate means.
- 141. TRAY/DISH DRYER
 - a. San-Aire Industries Model No. PD-100-M*C013
 - b. Kitchenware Dryer, Electric, lighted on/off rocker switch, (2) 20" x 6" x 3/8" removable aluminum filter, 826 CFM blower, adjustable air distribution louver, stainless steel housing, UL, CUL, NSF
 - c. Provide unit with the following:
 - RD-101 RapiDrain[™] Kitchenware Drainer, stainless steel construction, 1" x 3/16" flat bar with openings, 16 ga. formed ends, 1-1/2" 90° lip
 - 2) 2 ea RD-101-E RapiDrain[™] Kitchenware Drainer Extension, stainless steel construction, 1" x 3/16" flat bar with openings for water flow, 3/8" round rod cross bars, 16 ga. formed ends
 - 3) SMB-PD-100M Standard Wall Mount Bracket
- 142. SOAK SINK
 - a. To Be Fabricated
 - b. Soak Sink, portable, 20" working height, sink outlet fitted with quick-release drain, 22" x 22" x 8" deep fabricated sink compartment, stainless steel construction, casters, accommodates 19-3/4" x 19-3/4" dishwasher baskets.
- 143. GLASS RACK OVERSHELF
 - a. To Be Fabricated
 - b. Where shown on Drawings, provide a 16-gauge, stainless steel overhead rack shelf. Shelf to be size and shape as shown on Drawings. Shelf to incline down toward operator on 30 degree angle to a maximum point of 19" above tabletop. Set front edge 6" to 7-1/2" from front of table. Shelf to be set to allow operator to reach rear of cup/glass racks. Front of overshelf to be flanged up on an acute angle. Sides to flange up 2". Rear to be rolled down 1-1/2". Support Shelf on

heavy gauge stainless steel or chrome-plated wall mounting brackets. Brackets to be securely fastened to wall studs or best method available. Provide each lower end with a weep hole. Reference Drawings for typical tabletop

144. PASS WINDOW TRIM

a. Provide 16 ga ss pass window frame size and shape as shown on plan and details. Frame to be clam shell type . Coordinate with Soiled Dishtable pass-thru ledge.

END OF SECTION 114000

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SECTION 123661.19 QUARTZ AGGLOMERATE COUNTERTOPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- 1.2 SUMMARY
 - A. Section Includes:
 - 1. Quartz agglomerate countertops.
 - 2. Quartz agglomerate backsplashes.
 - 3. Quartz agglomerate end splashes.

1.3 ACTION SUBMITTALS

- A. Product Data: For countertop materials.
- B. Shop Drawings: For countertops. Show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.
 - 1. Show locations and details of joints.
 - 2. Show direction of directional pattern, if any.
- C. Samples for Initial Selection: For each type of material exposed to view.
- D. Samples for Verification: For the following products:
 - 1. Countertop material, 6 inches (150 mm) square.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For quartz agglomerate countertops to include in maintenance manuals. Include Product Data for care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.

QUARTZ AGGLOMERATE COUNTERTOPS

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate countertops similar to that required for this Project, and whose products have a record of successful in-service performance.
- B. Installer Qualifications: Fabricator of countertops.

1.7 FIELD CONDITIONS

A. Field Measurements: Verify dimensions of countertops by field measurements after base cabinets are installed but before countertop fabrication is complete.

1.8 COORDINATION

A. Coordinate locations of utilities that will penetrate countertops or backsplashes.

PART 2 - PRODUCTS

2.1 QUARTZ AGGLOMERATE COUNTERTOP MATERIALS

- A. Quartz Agglomerate: Solid sheets consisting of quartz aggregates bound together with a matrix of filled plastic resin and complying with ICPA SS-1, except for composition.
 - 1. Manufacturers: Refer to Finish Schedule for Basis of Design. Alternate manufacturers are permitted in accordance with section 012500 SUBSTITUTION PROCEDURES and section 016000 PRODUCT REQUIREMENTS.
 - 2. Colors and Patterns: Refer to Finish Schedule.
- B. Particleboard: ANSI A208.1, Grade M-2-Exterior Glue.
- C. Plywood: Exterior softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded.

2.2 COUNTERTOP FABRICATION

- A. Fabricate countertops according to quartz agglomerate manufacturer's written instructions and the AWI/AWMAC/WI's "Architectural Woodwork Standards."
 - 1. Grade: Custom.
- B. Configuration:
 - 1. Front: Straight, slightly eased at top.
 - 2. Backsplash: Straight, slightly eased at corner.
 - 3. End Splash: Matching backsplash.

- C. Countertops: 3/4-inch- (19-mm-) thick, quartz agglomerate with front edge built up with same material.
- D. Backsplashes: 1/2-inch- (12.7-mm-) thick, quartz agglomerate.
- E. Fabricate tops with shop-applied edges unless otherwise indicated. Comply with quartz agglomerate manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.
 - 1. Fabricate with loose backsplashes for field assembly.
- F. Joints: Fabricate countertops without joints.
- G. Joints: Fabricate countertops in sections for joining in field.
 - 1. Joint Locations: Not within 18 inches (450 mm) of a sink or cooktop and not where a countertop section less than 36 inches (900 mm) long would result, unless unavoidable.
 - 2. Joint Type: Bonded, 1/32 inch (0.8 mm) or less in width.
- H. Cutouts and Holes:
 - 1. Undercounter Plumbing Fixtures: Make cutouts for fixtures in shop if possible using template or pattern furnished by fixture manufacturer. Form cutouts to smooth, even curves.
 - a. Provide vertical edges, slightly eased at juncture of cutout edges with top and bottom surfaces of countertop and projecting 3/16 inch (5 mm) into fixture opening.
 - b. Provide vertical edges, rounded to 3/8-inch (10-mm) radius at juncture of cutout edges with top surface of countertop, slightly eased at bottom, and projecting 3/16 inch (5 mm) into fixture opening.
 - c. Provide 3/4-inch (20-mm) full bullnose edges projecting 3/8 inch (10 mm) into fixture opening.
 - 2. Counter-Mounted Plumbing Fixtures: Prepare countertops in shop for field cutting openings for counter-mounted fixtures. Mark tops for cutouts and drill holes at corners of cutout locations. Make corner holes of largest radius practical.
 - 3. Fittings: Drill countertops in shop for plumbing fittings, undercounter soap dispensers, and similar items.

2.3 INSTALLATION MATERIALS

- A. Adhesive: Product recommended by quartz agglomerate manufacturer.
- B. Sealant for Countertops: Comply with applicable requirements in Section 079200 "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates to receive quartz agglomerate countertops and conditions under which countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of countertops.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install countertops level to a tolerance of 1/8 inch in 8 feet (3 mm in 2.4 m), 1/4 inch (6 mm) maximum. Do not exceed 1/64-inch (0.4-mm) difference between planes of adjacent units.
- B. Fasten countertops by screwing through corner blocks of base units into underside of countertop. Predrill holes for screws as recommended by manufacturer. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with quartz agglomerate manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
- C. Fasten subtops to cabinets by screwing through subtops into cornerblocks of base cabinets. Shim as needed to align subtops in a level plane.
- D. Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.
- E. Install backsplashes and end splashes by adhering to wall and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears.
- F. Install aprons to backing and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears. Fasten by screwing through backing. Predrill holes for screws as recommended by manufacturer.
- G. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.
 - 1. Seal edges of cutouts in particleboard subtops by saturating with varnish.
- H. Apply sealant to gaps at walls; comply with Section 079200 "Joint Sealants."

END OF SECTION 123661.19

02419- Alabama A&M University Knight Complex Cafeteria Renovation

SECTION 21 00 00 - FIRE PROTECTION SPECIFICATION COVER SHEET

210500 - Fire Suppression General Provisions210553 - Fire Protection Identification211313 - Wet Pipe Sprinkler Systems



SECTION 210 00 - FIRE SUPPRESSION GENERAL PROVISIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. Provide all labor, materials, equipment and services required for complete installation of all fire suppression general provisions indicated on Drawings and specified herein.
- B. The Work shall include the furnishings of systems, equipment, and materials specified in this Division and as required by Contract Documents to include: supervision, operation, methods, and labor for the fabrication, installation, start-up, and tests for the complete Fire Suppression System installation.
- C. Drawings for the Work are diagrammatic, intended to convey the scope of the Work and to indicate the general arrangement and locations of the Work. Certain basic items such as pipe fittings, access panels, and sleeves may not be shown. This Contractor shall be responsible for confirming the fixtures, piping and equipment fit the space provided. The location and sizes for pipe fittings, sleeves, inserts, and other basic items required by code and other sections shall be coordinated and included for the proper installation of the work. This Contractor is responsible for reviewing all Contract Documents i.e. Drawings, Specifications, etc. of all Trades.
- D. Device and Equipment Specification may not deal individually with minute items required such as components, parts, controls, and devices which may be required to produce the equipment performance specified or as required to meet the equipment warranties. Where such items are required, they shall be included by the supplier of the equipment, whether or not specifically called for in the Contract Documents.

- E. Where the words "provide," "furnish," "include," or "install" are used in the Specification or on the Drawings, it shall mean to furnish, install, and test complete and ready for operation, the items mentioned. If an item is indicated in the Contract Documents, it shall be considered sufficient for including same in the work.
- F. Where noted on the Drawings or where called for in other Sections of the Contract Documents, the Contractor for this Division shall install equipment furnished by Others, and shall make required service connections. Contractor shall verify with the supplier of the equipment the requirements for the installation.
- G. Coordinate with all trades in submittal of shop drawings. Shop drawings shall be prepared clearly indicating all applicable components. Shop drawings shall be submitted to the Engineer in .dwg format and hard copy for mark-ups. Space conditions shall be detailed to the satisfaction of all concerned trades, subject to review and final acceptance by the Engineer. In the event that the Contractor installs his work before coordinating with other trades or so as to cause any interference with work of other trades, the necessary changes shall be made in the work to correct the condition, at no additional cost to the Owner.

1.3 SEISMIC RESTRAINT / PROTECTION

A. All Fire Protection Systems shall be seismically restrained and protected including sway bracing, flexible couplings, etc. Unless otherwise noted on the Drawings, Specifications and or general Contract Documents, the Seismic Site Class shall be "D" and Design Category shall be "C." The seismic design shall be by a competent Professional Engineer licensed in the Project's State. The Professional Engineer responsible for the seismic design shall have no less than 5 years experience in the design of seismic protection systems. The Contractor installing the seismic protection shall have no less than 5 years experience in the installation of seismic protection systems shall meet the Contractor's Qualifications herein. Seismic designer shall coordinate with Architectural Life Safety Drawings and Structural Engineer / Drawings, prior to bid, and determine the required extent of Seismic restraint / protection.

1.4 CODES AND STANDARDS

A. Conform to latest edition of governing codes, ordinances, or regulations of city, county, state, and or authority having jurisdiction. Where local codes are not applicable, conform to latest edition of governing NFPA 13, NFPA 14, NFPA 20, NFPA 24, ASCE 7, International Building Code, International Plumbing Code; International Mechanical Code; International Fire Code and governing Electrical Code.

1.5 CONTRACTORS QUALIFICATIONS

- A. The qualifications of this Contractor shall be as follows:
 - 1. Contractor must be a licensed contractor, specific to this section's Trade, in the project's State.
 - 2. Contractor must be licensed with the State Fire Marshal's office.
 - 3. The Contractor shall have been in the fire protection contracting business for the last five consecutive years, under their current corporation name with more than 75% of the same corporate officers.
 - 4. The Contractor shall have completed at least two projects of comparable size and scope within the past two years without receipt of a Notice to Cure.
 - 5. If Contractor has received a Notice to Cure on any project, that Contractor is excluded from performing work on this project.
 - 6. The Contractor's main construction and service office shall be located within 150 driving miles distance of the project site unless approval, 10 days prior to project bid date, has been issued in writing by the Owner, Architect and Engineer.
 - 7. The Contractor shall provide substantiating proof of these requirements 10 days prior to project bid date. If substantiating proof is not submitted and approved, the Contractor will not be allowed to bid or work the project.
 - 8. The General Contractor shall not purchase this Contractor's equipment, materials, etc. All materials, equipment, labor, etc. required to perform the Work herein shall be at the cost of this Contractor.

1.6 FEES, PERMITS, AND INSPECTIONS

- A. Secure all permits and pay all fees required in connection with the Work.
- B. Coordinate and provide such inspections as are required by the Authorities with jurisdiction over the site.

C. Where applications are required for procuring of services to the building, prepare and file such application with the Utility Company. Furnish all information required in connection with the application in the form required by the Utility Company.

1.7 ACTIVE SERVICE

A. Existing active services; water, gas, sewer, electric, are to be located and shall be protected against damage. Do not prevent or disturb operation of active services which are to remain. If active services are encountered which require relocation, make request to authorities with jurisdiction for determination of procedures. Where existing services are to be abandoned, they shall be terminated in conformance with requirements of the Utility, Municipality and or Authority Having Jurisdiction.

1.8 SITE INSPECTION

- A. Contractor shall inspect the site to become familiar with conditions of the site which will affect his work and shall verify points of connection with utilities, routing of outside piping to include required clearances from any existing structures, trees or other obstacles.
- B. Extra payment will not be allowed for changes in the Work required because of Contractor's failure to make this inspection.

1.9 OPENINGS, CUTTING, AND PATCHING

- A. Coordinate the placing of openings in the new structure as required for the installation of the Fire Suppression Work.
- B. When additional patching is required due to failure to inspect work; then provide the patching required to properly close the openings, to include patch painting.
- C. When cutting and patching of the structure is made necessary due to failure to install piping, sleeves, or equipment on schedule, or due to failure to furnish, on schedule, the information required for the leaving of openings, then provide the cutting and patching as required.

1.10 WIRING FOR FIRE SUPPRESSION EQUIPMENT

- A. Division 26 shall provide power services for motors and equipment furnished by this Contractor to include safety disconnect switches, starters and final connections.
- B. Division 21 shall provide all motors and contactors for equipment furnished under this Division, except where they are an integral part of a motor control center which is provided under another Division.
- C. Provide internal wiring, alarm wiring required for fire protection and/or security, control wiring, and interlock wiring for equipment furnished.
- D. Coordinate with Division 26 all motors and other equipment which require electrical services. Provide schedule which shall include the exact location for rough-in, electrical load, size, and electrical characteristics for all services required.
- E. Where motors or equipment furnished require larger services or services of different electrical characteristics than those called for on the Electrical Drawings, this contractor shall coordinate with the Electrical Contractor and the Electrical Engineer to provide a larger service as required, the cost of which shall be the responsibility of this contractor.
- F. Electrical work provided under Division 21 shall conform to the requirements of Division 26.

1.11 SUBSTITUTIONS

- A. Substitutions for the scheduled and specified equipment shall only be done with the prior approval of the engineer, and shall be obtained in writing. Prior approvals shall be obtained no less than one week prior to the bid date. Prior approval shall not relieve the contractor of supplying equipment that meets the specifications, capacities, efficiencies, physical dimensions, etc.
- B. Any equipment submitted as "equal" to basis of design shall be accompanied with a comparison letter from the vender stating any differences from the equipment being submitted and the basis of design. A letter is also to be received from the vender, on the vender's letterhead stating that the vender has

received a copy of the job specifications, all addendums and applicable drawings.

1.12 SUBSTITUTIONS AND PRODUCT OPTIONS

- A. For products specified only by reference standard, select product meeting that standard, by any manufacturer.
- B. For products specified by naming several products or manufacturers, select any one of products and manufacturers named which complies with specifications.
- C. For products specified by naming several products or manufacturers and stating "or equivalent," "or equal," or "or Engineer approved equivalent," or similar wording, submit a request for proposed substitutions for any product or manufacturer which is not specifically named; for review and approval by the Engineer.
- D. For products specified by naming only one product and manufacturer, there may be an option of an Engineer approval of a product of equal or greater quality or size.

1.13 SUBSTITUTION SUBMISSIONS

- A. Contractor's Base Bid shall be per contract documents.
- B. Submit separate request for each substitution. Support each request with:
 - 1. Complete data substantiating compliance of proposed substitution with requirements stated in contract documents:
 - a) Product identification, including manufacturer's name and address.
 - b) Manufacturer's literature; identify:
 - (1) Product description.
 - (2) Reference standards.
 - (3) Performance and test data
 - c) Name and address of at least two similar projects on which product has been used, and date of each installation.

- d) Itemized comparison of the proposed substitution with product specified; list significant variations.
- e) Data relating to changes in construction schedule.
- f) Any effect of substitution on separate contracts.
- g) List of changes required in other work or products.
- h) Designation of availability of maintenance services, sources of replacement materials.
- i) Provide certification of product compatibility with adjacent materials.
- C. Substitutions will not be considered for acceptance when:
 - 1. They are indicated or implied on shop drawings or product data submittals without a formal request from Contractor or his supplier prior to bid.
 - 2. Acceptance will require substantial revision of contract documents.
 - 3. In judgment of Engineer, do not include adequate information necessary for a complete evaluation.
 - 4. Substitute products shall not be ordered or installed without written acceptance of Engineer.
 - 5. Engineer will determine acceptability of proposed substitutions.

1.14 CONTRACTOR'S SUBSTITUTION RESPONSIBILITIES

- A. In making formal request for substitution, Contractor represents that:
 - 1. Contractor has investigated proposed product and has determined that it is equivalent to or superior in all respects to that specified.
 - 2. Contractor will provide same warranties or bonds for substitution as for product specified.
 - 3. Contractor will coordinate installation of accepted substitution into the work, and will make such changes as may be required for the work to be complete in all respects. This includes revisions due to changes in electrical characteristics, physical size and weight, service requirements, service clearances, etc.
 - 4. Contractor waives claims for additional costs caused by substitution which may subsequently become apparent.
- B. The Contractor shall have included all costs associated with the substitution for the specified products or materials, and that no additional cost will be incurred by any other party in order to fully incorporate the substituted item(s).

C. The Contractor agrees to reimburse the Architect/Engineer for any architectural or engineering re-design that is required by the substitution to be fully incorporated. The reimbursement shall be at the Architect/Engineer's standard billing rate.

1.15 ENGINEER'S DUTIES

A. Notify Contractor in writing of decision to accept or reject requested substitution.

1.16 PROTECTION

- A. Special care shall be taken for the protection of equipment furnished. Equipment and material shall be completely protected from weather elements, painting, plaster, etc. until the project is completed. Damage from rust, paint, scratches, etc. shall be repaired as required to restore equipment to original condition.
- B. Where the installation or connection of equipment requires work in areas previously finished by other Contractors, the area shall be protected and not marred, soiled, or otherwise damaged during the course of such work. Contractor shall coordinate with the other Contractors for repairing and refinishing of such areas which may be damaged.
- C. When welding is required inside building, provide one man for a fire watch. Fire watch shall require adequate protection of existing surfaces and observance of lower floors where penetrations exist.

1.17 SUBMITTALS

- A. General:
 - 1. Submit to Engineer shop drawings and product data required by the drawings and specifications.
 - 2. Contractor shall compile all data including but not limited to materials and construction details, ductwork layout, ceiling devices, manufacturer's

catalog and product data, controls wiring diagrams and material data, piping, insulation, heads, devices, etc.

- Submit in .dwg format to Engineer and a minimum of 2 scalable, minimum 1/8" = 1'-0" copies, more if required by the Architect. The drawing's layout sheet sizes shall be formatted to 24" x 36" or 30" x 42".
- B. Submittal Requirements:
 - 1. Review shop drawings and product data prior to submission to Engineer.
 - 2. Submit only complete project submittals. Partial submittals or submittals not complying with the above requirements shall be returned to the contractor un-marked and rejected.
 - 3. Contractor shall compile all data required to satisfy the Scope of Work implied by the Contract Documents.
 - Submit a minimum of 6 copies of data, more if required by the Architect. Coordinate with Architect and Engineer to verify if Electronic Submittals, i.e. PDF, will be allowed or required prior to bidding the project. If Electronic Submittals are allowed, 2 bound hard copies must be submitted as well as the Electronic file.
 - 5. Prepare submittals compiled in a 3-ring, hard bound, loose leaf binder. The face of the binder shall be clearly marked with the project title and number, the name of the Owner, Architect, Engineer, General Contractor and this contractor.
 - 6. The first page shall provide an index, numerically indicating all sections applicable to this submittal.
 - 7. Provide tab dividers for each section submitted. In the event an item appears on the drawings not specifically covered by the specifications, provide an additional numeric tab at the end of the index detailing the item and include the submittal data in the binder.
 - 8. All equipment included on the submittal sheets shall be marked to indicate the equipment as shown on the drawings. The equipment shall be high-lighted, where necessary, to clarify which items are being submitted.
 - 9. If long lead time items may be submitted pending written approval from the Engineer.
 - 10. Provide a tab for items not included and include an explanation of why item is not included in the submittal and the expected submittal date.
 - 11. Verify field measurements, field construction criteria and similar data.
 - 12. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by Engineer's review of submittals, unless Engineer gives written acceptance of specific deviations.
- 13. Notify Engineer in writing of deviations from requirements of Contract Documents at time submittals are made. A "deviation" shall be construed to mean a minor change to the sequence indicated on drawings or specification. A "deviation" is not intended to allow substitutions or product options.
- 14. Do not begin work which requires submittals until submittals have been returned with Engineer's stamp and initials or signature indicating review and approval and Fire Marshal's approval. Materials and equipment that were installed prior to being not approved shall be removed and replaced with approved items at no additional cost to other parties.
- 15. Shop Drawings and/or submittals requiring resubmission to the Engineer due to non-compliance with the Contract Documents and/or incompleteness shall be thoroughly reviewed by the Contractor prior to delivery to the Engineer for review. The Contractor shall ensure the completeness and compliance of the submittal materials and shall reimburse the Engineer at their standard hourly billing rates for review of submittals/shop drawings beyond the second submission.
- 16. Attention is directed to the fact that Engineer's review is only to check for general conformance with the design concept of the project and general compliance with Contract Documents. No responsibility is assumed by Engineer for correctness of dimensions, details, quantities, procedures shown on shop drawings or submittals.
- 17. Omission in shop drawings of any materials indicated in Contract Drawings, mentioned in Specifications, or required for proper execution and completion of Work, does not relieve the Contractor from responsibility for providing such materials.
- 18. Approval of a separate or specified item does not necessarily constitute approval of an assembly in which item functions.

1.18 OPERATING AND MAINTENANCE MANUALS

- A. General:
 - 1. Provide three up-to-date copies of shop drawings, product data, and other information described in this Section for use in compiling operating and maintenance manuals.
 - 2. Provide legible submittals made by permanent reproduction copy equipment from typewritten or typeset originals.
 - 3. Pre-punch 8-1/2 inch x 11 inch sheets for standard three ring binders.
 - 4. Submit larger sheets in rolled and protected packages.

B. Compilation:

- 1. The Contractor will receive shop drawings, brochures, materials lists, technical data of all types, warranties, guarantees, and other pertinent information and will assemble, catalog, and file information in loose-leaf, hardback three-ring binders.
- 2. Submittal Format: Provide each of the following items, as applicable, for each required item or system. Requirements will vary, depending on the equipment. Refer to specific Specification section requirements.
 - a) Item: Use appropriate Section title.
 - b) System Description: Provide a detailed narrative description of each system, describing function, components, capacities, controls and other data specified, and including the following:
 - (1) Number of.
 - (2) Sizes.
 - (3) Type of operation.
 - (4) Detailed operating instructions, including start-up and shut-down of each system, with indications for position of all controls, as applicable.
 - (5) Wiring Diagrams: Complete wiring diagrams for internally wired components including controls.
 - (6) Operating Sequence: Describe in detail.
 - (7) Manufacturers Data: Provide catalog data sheets, specifications, nameplate data and parts list.
 - (8) Preventative Maintenance: Provide manufacturer's detailed maintenance recommendations.
 - (9) Troubleshooting: Provide manufacturer's sequence for trouble-shooting procedures for operational problems.
 - (10)Extra Parts: Provide a listing of extra stock parts furnished as part of the Contract.
 - (11) Warranties: Provide specific manufacturer's warranty. List each component and control covered, with day and date warranty begins, date of expiration and name, address and telephone number of person to contact regarding problems during warranty period.
 - (12) Directory: Provide names, addresses and telephone numbers of Contractor, its subcontractors, suppliers, installers and authorized service and parts suppliers. Format as follows:

Contractor: Address: Telephone No.: Person to Contact:

Subcontractor: Address: Telephone No.: Person to Contact:

Installer: Address: Telephone No.: Person to Contact:

Manufacturer: Address: Telephone No.: Person to Contact:

Local Service Representative: Address: Telephone No.: Person to Contact:

1.19 RECORD DRAWINGS

- A. Detailed Requirements for Record Drawings:
 - During the progress of the work, the Contractor shall require the job superintendent for the plumbing, mechanical and fire protection subcontractors to record on their field sets of drawings the exact locations, as installed, of all conduits, pipes, and ducts whether concealed or exposed which were not installed exactly as shown on the contract drawings.
 - 2. Upon completion of the work this data shall be recorded by a competent CAD operator in an electronic drawing file in .dwg format of no more than two versions past current. Electronic drawings in .dwg format will be furnished to the Contractor by the Architect/Engineer. Where the work was installed exactly as shown on the contract drawings the .dwg file shall not

be disturbed other than being marked "As-Built." In showing the changes, the same legend shall be used to identify piping, etc., as was used on the contract drawings. Separate electronic drawings shall be prepared for plumbing, mechanical and ventilating work unless two or more divisions are shown on the same sheets of the contract drawings, in which case the various subcontractors shall also show their changes on the same sheets. Each sheet shall bear the date and name of the Contractor submitting the drawings.

- 3. The Contractor shall review the completed As-Built drawings and determine that all data furnished on the .dwg files are accurate and truly represent the work as actually installed. The Contractor shall furnish true elevations and locations of all work properly referenced by using the original bench mark used for this project. The .dwg files, including those unchanged and changed, shall be submitted to the Engineer.
- 4. The Engineer shall authorize the Contractor to produce and distribute the as-built drawings as follows:
 - a) One (1) disk to the Engineer.
 - b) One (1) disk to the Architect.
 - c) One (1) disk to the Owner.

1.20 FINISHING

- A. General: Prior to acceptance of the installation and final payment of the Contract, the Contractor shall perform the work outlined herein.
- B. Cleaning: At the conclusion of the construction, the site and structure shall be cleaned thoroughly of all debris and unused materials remaining from construction. All closed off spaces shall be cleaned of all packing boxes, wood frame members, and other waste materials used in the mechanical construction.
- C. The entire system of piping and equipment shall be cleaned internally. The Contractor shall open all dirt pockets and strainers, completely blowing down as required and clean strainer screens of all accumulated debris.
- D. All tanks, devices, and pumps shall be drained and proven free of sludge and accumulated matter.
- E. All temporary labels, stickers, etc., shall be removed from all devices and equipment. (Do not remove permanent name plates, equipment model

numbers, ratings, etc.). All equipment shall have affixed adjacent to the permanent nameplate, the unit identification on an engraved label with permanent adhesive.

F. Devices, equipment, tanks, pumps, etc., shall be thoroughly cleaned.

1.21 TEST AND DEMONSTRATIONS

- A. Systems shall be tested and placed in proper working order prior to demonstrating systems to Owner.
- B. Prior to acceptance of the fire protection system installation, demonstrate to the Owner or his designated representatives all essential features and functions of all systems installed, and instruct the Owner in the proper operation and maintenance of such systems. Contractor shall allow for five (5) working days to perform the demonstrations.
- C. Provide necessary trained personnel to perform the demonstrations and instructions. Provide manufacturer's representatives for systems as required to assist with the demonstrations.
- D. Dates and times for performing the demonstrations shall be coordinated with the Owner.
- E. Upon completion of demonstrations, provide a certificate testifying that demonstrations have been completed. Certificate shall list each system demonstrated, dates demonstrations were performed, names of parties in attendance, and shall bear signatures of contractor and owner.

1.22 PAINTING AND IDENTIFICATION

- A. Touch-up paint where damaged on equipment furnished with factory applied finish, to match original finish.
- B. Provide engraved, laminated plastic tags for all equipment. Tags shall be attached with permanent adhesive.

1.23 EXCAVATING, TRENCHING, AND BACKFILLING

- A. Provide excavation necessary for underground water piping, etc., and backfill such trenches and excavations after work has been installed and tested. Care shall be taken in excavating, that walls and footings and adjacent load bearing soils are not disturbed, except where lines must cross under a wall footing. Where a line must pass under footing, the crossing shall be made by the smallest possible trench to accommodate the pipe. Excavation shall be kept free form water by pumping if necessary. No greater length of trench shall be left open, in advance of pipe and utility laying, than that which is authorized.
- B. Trenches for piping and utilities located inside foundation walls and five (5) feet outside of the wall shall be not less than sixteen (16) inches or more than twenty-four (24) inches wider than the outside diameter of the pipe to be laid. The widths of trenches for piping and utilities located more than five (5) feet outside of building foundation walls shall be governed by conditions found at the site.
- C. Pipes must be buried 36" (min.) to the top of the pipe. Trenches must be back-filled and tamped in accordance with NFPA 24. Grade the trench and provide 6" sand base for the pipe, with the body of the pipe supported. Bottoms of trenches shall be so shaped that when pipe is in place the lower fourth of the circumference for the full length of the pipe will be supported on compacted fill. Bell holes shall be dug so that no part of the weight of the pipe is supported by the bell but shall be no larger than necessary for proper jointing. All piping required for the structure shall be excavated to at least (6) inches below pipe invert.
- D. Immediately after testing and/or inspection, the trench shall be carefully backfilled with earth free from clods, brick, etc., to a depth one-half the pipe diameter and then firmly puddled and tamped in such a manner as not to disturb the alignment or joints of the pipe. Thereafter, the backfill shall be puddled and tamped every vertical foot.

1.24 CONCRETE WORK

A. Provide concrete bases and housekeeping pads for equipment unless indicated otherwise. Concrete work shall be as specified in the applicable Civil/Site and Structural Sections. Vibration pads, equipment bases, pipe supports and thrust blocks shall be provided by this Contractor.

B. Provide equipment anchor bolts and coordinate their proper installation and accurate location.

1.25 ACCESS PANELS

- A. Access Panel shall be of appropriate size to allow for full service and removal of device behind the access panel.
- B. Provide access panels where required and not shown on the drawings for installation by the drywall or masonry Contractor. Access panels shall be steel, primed ready for paint. All access panel locations shall be approved by the Architect/Engineer.
- C. Provide fire rated access panels in rated walls, ceilings and floors. Rates shall be in compliance to the assemblies rating. This Contractor shall review Life Safety Drawings for required locations of fire rated access panels.

1.26 SLEEVES

- A. Sleeves passing through non-load bearing or non-fire rated walls and partitions shall be Schedule 40 PVC pipe or cast iron pipe.
- B. Sleeves passing under or through load bearing walls, concrete beams, foundations, footings, and waterproof floors shall be Schedule 40 galvanized steel pipe. Sleeve diameter shall be a minimum of 2 pipe sizes larger than pipe being protected.
- C. Sleeves for insulated piping shall be of sufficient internal diameter to take pipe and insulation and to allow for free movement of pipe. Sleeve diameter shall be a minimum of 2 pipe sizes larger than pipe being protected. Waterproof sleeves shall be of sufficient internal diameter to take pipe and waterproofing material.
- D. In finished areas where pipes are exposed, sleeves shall be terminated flush with wall, partitions, and ceilings, and shall extend 1/2" above finished floors.
 Extend sleeves 1" above finished floors in areas likely to entrap water.

1.27 ESCUTCHEONS

A. Provide chrome plated escutcheons at each sleeved opening into finished and exposed exterior spaces. Escutcheons shall fit around pipe outside diameter and shall cover sleeve. Where sleeve extends above finished floor, escutcheon shall be high cap type and shall clear sleeve extension. Secure escutcheons or plates to sleeve with set screws or other approved devices.

1.28 SIGNAGE

A. A metal sign with raised letters at least 1 inch in size shall be mounted on all fire department connections serving automatic sprinklers, standpipes or fire pump connections. Such signs shall read: AUTOMATIC SPRINKLERS, STANDPIPES, FIRE VAULT BUILDING "X" or TEST CONNECTION, or a combination thereof as applicable.

1.29 ANCHORING OF EQUIPMENT

A. All equipment located on floor slab, that is not mounted on wheels and is capable of being moved shall be secured to the floor with anchor bolts. A minimum of two bolts are required per each piece of equipment and bolts shall be of sufficient size to prevent equipment from overturning.

1.30 CONNECTIONS FOR DEVICES AND EQUIPMENT UNDER ANOTHER SECTION OR BY OWNER

- A. Rough all equipment requiring connection to systems provided under this Division. Verify requirements and current locations before proceeding with work.
- B. Make all connections to equipment furnished under another Section or by Owner as required to obtain complete and working systems.

1.31 SYSTEM GUARANTEE

A. Work required under this Division shall include one-year guarantee. Guarantee by Contractor to Owner to replace for Owner any defective workmanship or material which has been furnished under contract at no cost to the Owner for a period of one year from date of acceptance of systems. Guarantee shall also

include all reasonable adjustments of system required for proper operation during guarantee period. Guarantee shall not include normal preventative maintenance services.

B. At "Demonstration," one-year guarantee provision by Contractor shall be explained to Owner.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 210500

SECTION 210553 - FIRE PROTECTION IDENTIFICATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. Provide all materials, labor, administration and services required for complete installation of all fire protection identification indicated on Drawings and specified within this section.
- B. Provide label maker stickers on the ceiling grid main under a riser assembly, zone control valve, drain, Inspectors Test Station, air compressor, etc. location indicating the system or system served. Coordinate with the Architect prior to label installation.

1.3 SUBMITTALS

A. Submit samples and manufacturer's installation instructions for all identification products used.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Pipe Markers:
 - 1. Equal to Seton Snap Around Pipe Markers. Acrylic plastic with UV inhibitors. Markers shall indicate direction of flow. Legends shall be alternately reversed and repeated for viewing from any angle. Markers shall be factory formed for the installed diameter.

- B. Valve Markers:
 - Engraved Metal Tack Markers shall be provide and pop riveted to the Tee Bar main for use of identifying valve locations above acoustical tile ceilings. Color to be selected by submittal. Markers shall be numbered with standard 3/16" characters.
 - 2. Valve tags shall be Seton, 2" stamped brass tags with chain. Tag shall indicate floor served and service of respective valve.

PART 3 - EXECUTION

3.1 PIPING

- A. Piping shall be identified at maximum 20 feet intervals, at each side of floor / wall penetration, and at each valve. Piping identification shall include type of service and direction of flow.
- B. Piping shall be marked by the following schedule:
 - 1. Wet System: Red letters on White.
 - 2. Dry Pipe System: Red letters on White.
 - 3. Deluge System: Red letters on White.

END OF SECTION 220553

SECTION 211313 - WET PIPE SPRINKLER SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. Provide all labor, materials, equipment and services required for complete installation of all fire suppression general provisions indicated on Drawings and specified herein.
- B. The work included under this section consists of automatic sprinkler system(s) for the area of construction. System(s) shall include but not be limited to exterior piping, vault, fire hydrant(s), post indicator valve, water main from the vault to the building, interior piping, valves, flow switches, gauges, tamper switches, inspectors test stations with sight glass, system drains and piping necessary for a complete and operating fire protection system. The system shall be installed for complete building coverage.
 - 1. Heads shall not be provided in electrical or data rooms that house only electrical switchgear, transformers, etc. and the room has a 2 hour fire rating. If heads are required in rooms with a mix of occupancy, storage, etc. and electrical switchgear, rooms shall be sprinkled with diverter baffles to direct water away from electrical panels or as required by AHJ.
- C. Integration of the fire protection system into the fire alarm system shall be by the Contractor responsible for the fire alarm system. Fire Protection Contractor to coordinate with the said Contractor for provisions of additional tamper and flow switches in areas other than the risers and inside the backflow preventer vault.
- D. Fire Protection Contractor shall define the exact quantity and placement of heads. System hydraulic calculations, piping and head location design shall be

performed, stamped and sealed, dated and signed by a Professional Engineer licensed in the project's State. Pipe routing shall be coordinated with all exposed and above ceiling systems i.e. piping, conduit, ductwork, structure, architectural features, etc. Sprinkler heads to be installed in all areas both open and concealed to protect all areas as required by the AHJ's adopted codes, regulations and NFPA 13.

- E. Submittals, shop drawings and hydraulic calculations shall be submitted for approval to the Owners Insurance Carrier, State Fire Marshall, City Fire Inspector, and Local Fire Prevention Bureau for approval prior to submittal to the Engineer or beginning construction. Coordinate with Fire Marshal prior to submittal to confirm Fire Marshal does not require Engineer's review prior to submittal to the Fire Marshal for review.
- F. Heads shall be installed in center of tile. Piping and heads installed in areas where no ceilings exist shall be coordinated with exposed lights and equipment. Heads installed in areas where the lay-in ceiling lower than 9'-6" shall be concealed mount heads with flush cover plates. Heads installed in areas of gyp-board or furred down gyp-board ceilings shall be concealed mount heads with flush cover plates. Concealed head plate color shall be selected by the Architect during the submittal phase.
- G. Heads in all exposed ceiling areas shall be installed with red epoxy coated wire guards.
- H. The Fire Protection Contractor shall install both the underground and above ground systems as listed in these Specifications. No other Contractor shall install any Fire Protection piping.

1.3 CODES AND STANDARDS

A. Conform to latest edition of governing codes, ordinances, or regulations of city, county, state, and or authority having jurisdiction. Where local codes are not applicable, conform to latest edition of governing NFPA 13, NFPA 14, NFPA 20, NFPA 24, NFPA 101, International Building Code, International Plumbing Code, International Mechanical Code, International Fire Code and governing Electrical Code.

1.4 SUBMITTALS

WET PIPE SPRINKLER SYSTEMS

- A. See 21 05 00 for general submittal requirements.
- B. After system submission and approval from the Owners Insurance Carrier, the Contractor shall submit 6 sets of detailed drawings for all fire protection systems showing the data required for working plans. Approval for the shop drawings and hydraulic calculations must be obtained prior to fabrication of the fire protection system.
- C. Submit hydraulic design calculations and other information required in NFPA 13 & 24 for hydraulically designed sprinkler systems. All fire protection devices shall be UL & FM approved. The "Room Method" shall not be used to calculate required coverage. A Safety Facture of 10psi or 10%, which ever is greater, shall be applied to the hydraulic calculations.
- D. Upon completion of the installation, the contractor shall provide as-built drawings in .dwg CAD format to the Engineer for review.
- E. Devices are specified by manufacture and model numbers for the purpose of establishing type and quality. Equal devices shall be submitted for consideration 10 days prior to bid.
- F. All submittals shall be clearly designated as to the type, listing, temperature rating, finish, etc. All shop drawings and hydraulic calculations shall have an index, legend and description of all abbreviations.

PART 2 - PRODUCTS

2.1 PIPING

- A. Underground pipes shall be Class 350 pressure rated cement lined ductile iron. Joints at all fittings and valves shall be welded or threaded. Pipes must be buried 36" (min.) to the top of the pipe. Trenches must be back-filled and tamped in accordance with NFPA 24. Grade the trench and provide 6" sand base for the pipe, with the body of the pipe supported.
- B. Above grade piping:
 - 1. 1-1/2" and below: Schedule 40 black steel.
 - 2. 2" and larger: Schedule 10 black steel.

2.2 SLEEVES

A. Provide schedule 10 black steel sleeves for all pipes passing through floors or walls. Seal the annular space between the pipe and sleeve with rock wool or other approved non-combustible material. Fire caulking on rated wall and floor penetrations shall be 3M, Metacaulk or equal, conforming to the UL listing of the penetration and as detailed on the drawings.

2.3 VALVES

A. Valves shall be rated for the working pressure as required system, shall be UL listed and FM approved and shall be as approved by the Authority Having Jurisdiction. Valves shall be Nibco GD-4865. Coordinate installation with the Electrical/Fire Alarm Contractor.

2.4 HEADS

- A. Sprinkler heads shall be as required for specified hazard and installation location.
- B. Heads installed in areas with ceilings shall be chrome finish recessed pendant with chrome escutcheons unless otherwise noted.
- C. All recessed heads are to be bulb type.
- D. Concealed heads cover plates will have enamel finish. Submit color chart for selection by the Architect during the submittal phase. Heads by Reliable for the specific hazard and installation.
- E. Furnish spare heads of each type head installed on the project. Heads shall be stored in boxes along with a service wrench near each riser. Head quantity shall be in accordance to NFPA 13, but with the minimum quantity being six (6) of each type on the connected riser system. Furnish multiple cabinet boxes as required. The cabinet shall also include a laminated copy of the Owner's Certificate per NFPA 13. A list with an applicable legend of the sprinklers installed in the property shall be laminated and posted in the sprinkler cabinet. The list shall include:

- 1. The Sprinkler Identification Number (SIN) if equipped or the manufacture, model, orifice, deflector type, thermal sensitivity and pressure rating.
- 2. General description.
- 3. Quantity of each contained in the cabinet.
- 4. Date, including revision if applicable, of the list.

2.5 INSPECTOR'S TEST AND DRAIN

A. Inspector's Test Valves shall be equal to AGF model 1011A, test and drain valve.

2.6 ALARM CHECK VALVES

A. Alarm check valves shall be equal to Reliable model E, cast iron water flow alarm check valve, with model E-1 trim, retarding chamber, pressure alarm switch and attachment to outside water motor gong; 175 psi working pressure. Multiple alarm check valves may be interlocked with one motor gong.

2.7 ELECTRIC ALARM BELL

A. Audible / Visible notification shall be by System Sensor model P2RK horn and strobe. Provide battery backup power supply. Horn and Strobe shall be mounted ~ 10' above finished grade. Installation shall be coordinated with the Architect.

2.8 POST INDICATOR VALVE

A. Post Indicator Valve shall be equal to Mueller no. A2052-6, iron body, bronze mounted valve. Post shall be Mueller A20806 adjustable indicator post & removable handle. Lock to be provided to secure the handle to the body lug. Riser extension from the valve body to the indicator post shall be as specified for underground piping. Indicator shall be installed with a weatherproof tamper switch. Conduit riser from grade to the base of the tamper switch shall be rigid. Coordinate installation with the Electrical/Fire Alarm Contractor.

2.9 FIRE DEPARTMENT CONNECTIONS

WET PIPE SPRINKLER SYSTEMS

A. Fire Department connections at the vaults shall be equal to Potter-Roemer series 5761-B, 4"x 2 ¹/₂" two-way with brass body, identification plate, plugs, chains and 24" high seamless brass cover sleeve. Furnish brass nozzle covers. Lettering to read "Auto Spkr". Minimum of two connections are required.

2.10 FIRE MAIN VAULTS

- A. Fire Main Vaults shall be as manufactured by Eagle Wholesale series 9648, 96" x 48" x 48" deep pre-cast reinforced concrete vault. Frame and lid to be Eagle series 9648 with optional hydraulically assisted two-piece aluminum doors. Door locks and hinges to be stainless steel. Frame channel to be self-draining to grade. Drain to be installed from the frame channel horizontally thru the side of the vault. Vault shall be factory fitted with the backflow preventer, fire department check valve with ball drip and piping thru the vault walls for connection by the Fire Protection contractor. Pipes within the vault to be class 350 cement lined ductile iron. Vault installation shall be as detailed on the drawings. Permanent ladder / steps shall be provided within vaults deeper than 4 feet below grade.
- B. Fire protection backflow preventer inside the fire main vaults shall be Ames model Colt C3000SY, 304 stainless steel body two independent Tri-Link check modules within a single housing, sleeve access port, four test cocks and two drip tight shutoff valves. Checks shall be removable and serviceable without use of special tools. By-pass meter assembly shall consist of a meter, double check valve assembly and required test cocks. Meter to be calibrated in gpm.

2.11 FIRE HYDRANTS

A. Fire hydrants shall be equal to Mueller Model Super Centurion 250, M & H series 129 traffic model or prior approved equal. Hydrants to have a pumper nozzle and two 2-1/2" hose nozzles. Hydrant and all threaded connections to conform to the local Fire Marshal standards. Coordinate with Fire Marshal prior to submitting. Submittal must indicate approval from Fire Marshal. Hydrant shall be 3' minimum bury with 6" mechanical joint connections and shall be UL approved. Fire hydrant service valves shall Mueller model A-2050-6. Valve shall be accessible thru an adjustable ductile iron roadway box.

2.12 SPRINKLER SYSTEM MONITORING

- A. Fire Vault Supervisory: Switches shall be System Sensor PSP1, rain tight, NEMA 3 housing and water resistant adjustable length 8' cord, tamper resistant cover screws, UL listed and FM approved with lockout feature. Coordinate installation with the Electrical/Fire Alarm Contractor.
- B. Interior OS&Y Valve Supervisory: Switch shall be System Sensor model OSY2, die cast weatherproof body with carriage bolts and clamping bar, with two switches each rated with the capacity of 10 amp @125/250 VAC and 2.5 amp @24 VDC. The cover shall be installed with tamper resistant screws. The switch shall be UL listed & FM approved.
- C. Water Flow Detector: System Sensor model WFD, vane type detector. Detector shall be mounted above the riser trim and located at least 6" from any fittings and no closer than 24" from a valve or drain. Detectors shall have a sensitivity range of 4 10gpm and a static pressure rating of 450psi. The sensor shall response to water flow in a specific direct after a preset time delay. Preset time delay shall be field adjustable. The delay mechanism shall be a sealed pneumatic unit with visual indication of actuation. Outputs shall consist of dual SPDT switches. All detectors shall have a UL listing for indoor and outdoor use. Detector enclosure shall be NEMA 4.
 - 1. Water Flow Detector for Elevator Recall: Potter VS-SP with no time delay. Contractor shall make necessary provisions to eliminate water surge that could cause false alarms due to lack of time delay.
 - 2. Detector located at least 6" from any fittings, valve or drain. Detectors shall have a sensitivity range of 10gpm and a service pressure rating of 250psi.

2.13 DRY PIPE VALVE

A. Reliable model D, flanged, iron body, bronze mounted with one piece air and water seats.

2.14 DRY PIPE BRANCH AIR COMPRESSOR

Provide 120 volt air compressor, trimmings for test by-pass, gages, drain connections and interlocks with the exterior horn and strobe in accordance to NFPA 13. The air compressor shall be 1/6 HP, 120/1/60 pipe / riser mounted. The air compressor air pressure maintenance device shall be Reliable Model B-1. The device shall be furnished with the optional pressure gauge. The gauge shall

be graduated to where the operating pressure is in the middle of the pressure range of the gauge.

2.15 DOUBLE INTERLOCK PRE-ACTION DELUGE SYSTEM

A. Valve shall be Reliable model DDX. Size shall be determined by hydraulic calculations with the smallest size being 2". System shall complete with deluge riser assembly, double interlock trim with dry pilot line with 155°F release heads, releasing/control panel with 90 hour battery backup and remote annunciator, polarized sounder/strobe fire alarm and polarized sounder trouble strobe, electric emergency station, room detectors, air compressor and nitrogen regulating device with tank and optional low pressure air pressure switch. This Contractor shall provide the Rate of Rise detectors specific to the releasing/control panel. Quantity of the detectors and dry pilot heads, spacing and installation locations shall be as required by the manufacturer for the quantity of rooms and the square footage and linear feet of the space(s) being protected. Unless otherwise directed by the device manufacture, the detectors and fix temperature dry pilot heads shall be located in the ceiling or 6" from the roof deck. The air compressor shall be 1/6 HP, 120 volt. Remote annunciator shall be installed where directed by the Owner. The Fire Protection Contractor shall be responsible for coordinating all wiring and conduit required with the General, Electrical and Fire Alarm Contractors.

2.16 HOSE CABINETS

- A. Class I hose cabinet shall be Potter Roemer model 1810-B break glass with lock and break handle. Cabinet color finish shall match the wall color and Architect's approval. Submit a color selection chart to the Architect for approval. Provide required signage per IBC, IFC and NFPA. Verify hose thread connections with local Fire Department prior to ordering cabinet.
- B. Class II hose cabinets shall be Potter Roemer 1000 series. All cabinets shall be recessed mounting type unless otherwise indicated on the drawings. Recessed cabinets shall be model 1004, surface mounted cabinets shall be model 1054. Cabinets installed in a fire rated wall shall be model FRC1004. Cabinet's door shall be flush with break glass, lock and break handle. Cabinet color finish shall match the wall color and Architect's approval. Submit a color selection chart to the Architect for approval. Provide required signage per IBC, IFC and NFPA.

Verify hose thread connections with local Fire Department prior to ordering cabinet.

PART 3 - EXECUTION

3.1 GENERAL

- A. Licensed Fire Protection Contractors regularly engaged in installation of fire protection systems shall do the installation of all above and below ground systems. Reference Section 21 05 00 for additional requirements.
- B. Fire Protection Contractor shall verify flow and pressure available prior to bidding project.
- C. Equipment, materials and workmanship shall be guaranteed for one year after acceptance of the installation. Contractor shall replace defective parts, materials and defects caused by workmanship.
- D. Contractor shall coordinate with local Utilities and actual site conditions for locations of all underground utilities in the area of new construction prior to starting excavation for piping.
- E. Contractor shall coordinate with local Utilities for installation and tapping requirements where applicable. Secure all necessary permits and pay all charges.
- F. Coordinate the fire protection work with all Trades.
- G. Independent risers indicated on the Drawings shall be installed with O. S. & Y gate valves with tamper switches.
- H. Test fire mains at 200 psi hydrostatic pressure or 50 psi higher than operating system pressure when systems operate in excess of 150 psi. Test will be for four hours. Tests must be approved before the pressure is relieved.
- I. Completed installation of valves, piping and accessories in exposed areas shall be cleaned to as new condition. Any ferrous metals indicating rust shall have the rust removed and the areas coated with a rust inhibiting paint to match the factory surface.

J. Flush the fire mains with full force water to remove foreign materials. Apply 50 ppm chlorine disinfectant to the fire mains for a period of four hours then flush thoroughly.

END OF SECTION 211313

SECTION 230000 - MECHANICAL SPECIFICATION COVER SHEET

- 230500 Mechanical General Provisions
- 230532 Supports and Anchors
- 230553 Mechanical Identification
- 230560 Through Penetration Fire Stopping
- 230591 Testing, Adjusting, and Balancing
- 230710 Ductwork Insulation
- 233110 Galvanized Sheet Metal Ductwork
- 234319 Electronic Air Purification Systems



SECTION 220500 - PLUMBING GENERAL PROVISIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. Provide all materials, labor, management, equipment, fixtures, start-up, fabrication, services, cleaning, testing and balancing required for complete installation of all plumbing provisions indicated on Drawings, Schedules and specified in this section.
- B. This Contractor shall review all of the Contract Documents including all Drawings and Specifications of all Trades to ensure the complete implementation of Work.
- C. Where shown or noted on the Drawings or where called for in other Sections of the Contract Documents, the Contractor for this Division shall install equipment furnished by Others, and shall make required service connections. Contractor shall verify with the supplier of the equipment the requirements for the installation.
- D. Where the words "provide," "furnish," "include," or "install" are used in the Specification or on the Drawings, shall mean to furnish, install, and test complete and ready for operation, the items mentioned.
- E. Drawings for the Work are diagrammatic to express the scope of the Work and to indicate the general arrangement and locations of the Work. Due to Drawings constraints, certain items such as pipe fittings, offsets, access panels, devices and sleeves may not be shown. This Contractor shall be responsible for confirming that the fixtures, piping and equipment fit the space provided. The location and sizes for pipe, fittings, sleeves, access panels and other basic items

required by Code and other sections shall be coordinated and included for the proper installation of the work.

- F. Specifications may not deal with diminutive installation requirements, parts, controls, and devices required which may be required to produce the equipment performance specified or as required to meet the equipment warranties and applicable Code. Such items shall be included, whether or not specifically called for in the Contract Documents.
- G. Coordinate with all Trades in submittal of shop drawings. Shop drawings shall be prepared to clearly indicate all applicable components. Space conditions shall be detailed to the satisfaction of all trades, subject to review and final acceptance by the Engineer. In the event that the Contractor installs work before coordinating with other trades or so as to cause any interference with work of other Trades, the necessary changes shall be made to the work to correct, at no additional cost to the Owner, Architect or Engineer.

1.3 CONTRACTORS QUALIFICATIONS

- A. The qualifications of this Contractor for shall be as follows:
 - 1. Contractor must be a licensed contractor, specific to this section's Trade, in the project's State.
 - 2. The Contractor shall have been in the plumbing contracting business for the last five consecutive years, under their current corporation name with more than 75% of the same corporate officers.
 - 3. The Contractor shall have completed at least two projects of comparable size and scope within the past two years without receipt of a Notice to Cure.
 - 4. If Contractor has received a Notice to Cure on any project, that Contractor is excluded from performing work on this project.
 - 5. The Contractor's main construction and service office shall be located within 150 driving miles distance of the project site unless approval, 10 days prior to project bid date, has been issued in writing by the Owner, Architect and Engineer.
 - 6. The Contractor shall provide substantiating proof of these requirements 10 days prior to project bid date. If substantiating proof is not submitted and approved, the Contractor will not be allowed to bid or work the project.
 - 7. The General Contractor shall not purchase this Contractor's equipment, materials, etc. All materials, equipment, labor, etc. required to perform the Work herein shall be at the cost of this Contractor.

1.4 CODES AND STANDARDS

A. Conform to latest edition of governing codes, ordinances, adoptions and or regulations of the authority having jurisdiction. Where local codes are not applicable, conform to the latest International Code Counsel requirements.

1.5 FEES, PERMITS, AND INSPECTIONS

- A. Secure all permits and pay all fees required in connection with the Work.
- B. Coordinate and provide such inspections as are required by the Authorities having jurisdiction over the site.
- C. Where applications are required for procuring of services to the building, prepare and file such application with the authority having jurisdiction. Furnish all information required in connection with the application in the form required by the authority having jurisdiction.

1.6 SITE INSPECTION

- A. Contractor shall inspect the site to become familiar with conditions of the site which will affect this Contractor's work and shall verify points of connection with utilities, routing of Work to include required clearances from any obstacles.
- B. Additional payment will not be provided for changes in the Work required because of Contractor's failure of said familiarization and understanding.

1.7 ACTIVE SERVICE

A. Existing active services are to be located and shall be protected against damage. Do not disrupt operation, functionality and cleanliness of active services which are to remain. If active services are encountered which require relocation, make request to authorities having jurisdiction for determination of procedures. Where existing services are to be abandoned, they shall be terminated in compliance with requirements of the authority having jurisdiction.

1.8 SUBSTITUTIONS

- A. Any equipment, material, etc. submitted as "equal" to the basis of design shall be accompanied with a "one – to – one" comparison letter from the vender stating any differences from the equipment being submitted and the basis of design. A letter is also to be submitted from the vender, on the vender's letterhead, stating that the vender has received a copy of the job all Specifications, Addendums and Drawings.
- B. Substitutions for the scheduled and specified equipment shall only be done with the prior approval of the Engineer, and shall be obtained in writing. Prior approvals shall be obtained no less than 10 days prior to the project bid date. Prior approval shall not relieve the contractor of supplying equipment that meets the specifications, capacities, efficiencies, physical dimensions, etc.

1.9 SUBSTITUTIONS AND PRODUCT OPTIONS

- A. Products specified only by reference standard, select product meeting that standard in accordance to the projects funding requirements, i.e. Made in the USA.
- B. For products specified by naming several products or manufacturers, select any one of products and manufacturers named which complies with the schedules and specifications. When three are mentioned, the 10 day prior approval is still required.
- C. For products specified, noted or scheduled stating "or equivalent," "or equal" or similar wording, submit a request for proposed substitutions for any product or manufacturer which is not specifically named for review and prior approval by the Engineer.
- D. For products specified by naming only one product and manufacturer, the Engineer may provide approval of a product of equal or greater quality or performance. Submittal must be received 10 days prior to project bid date accompanied with a one – to – one comparison letter.

1.10 SUBSTITUTION SUBMISSIONS

- A. Each substitution submittal request shall be accompanied with:
 - 1. Comprehensive data proving compliance of proposed substitution with requirements stated in the contract documents:
 - a. Product identification.
 - b. Manufacturer's literature shall identify:
 - 1) Manufacturer's name, address, phone number, point of contact and email address.
 - 2) Product description.
 - 3) Reference standards.
 - 4) Performance and test / compliance data.
 - 5) Warranty information of all components.
 - c. Two projects of similar size and scope on which product has been used, date of each installation and project Owner's recommendation.
 - d. Itemized comparison of the proposed substitution with product specified listing any variations.
 - e. Changes in construction schedule.
 - f. How the substitution will affect other Trades.
 - g. List of changes required in any other work, products or required to be made by other Trades.
 - h. Availability of repair services, sources of replacement materials, etc.
- B. Substitutions will not be considered for acceptance when:
 - 1. Substitution requires substantial revision of contract documents.
 - 2. They are indicated or implied on shop drawings or product data submittals without a formal request from Contractor or Supplier prior to bid.
 - 3. Information is deemed inadequate by the Engineer necessary for complete evaluation.

1.11 CONTRACTOR'S SUBSTITUTION RESPONSIBILITIES

- A. Contractor affirms that:
 - 1. Contractor has determined that the substitution is equivalent to or superior in all respects to that scheduled and or specified.

- 2. Contractor will provide the same warranties, guarantees and or bonds for substitution as for product scheduled and or specified.
- 3. Contractor will coordinate installation of accepted substitution into the work, and will make changes as required for the work to be complete in all respects.
- 4. Contractor waives claims for additional costs caused by substitution.
- B. The Contractor shall have included all costs associated with the substitution for the specified products or materials, and that no additional cost will be incurred by any other party in order to fully incorporate the substituted item(s).
- C. The Contractor agrees to reimburse the Architect/Engineer for any architectural or engineering re-design that is required by the substitution to be fully incorporated. The reimbursement shall be at the Architect/Engineer's standard billing rate.

1.12 ENGINEER'S DUTIES

A. Notify Contractor in writing of decision to accept or reject requested substitution.

1.13 SUBMITTALS

- A. General:
 - 1. Submit to Engineer shop drawings and product data required by the Drawings and Specifications.
 - 2. Contractor shall compile all data required to satisfy the Scope of Work implied by the Contract Documents.
 - Submit a minimum of 6 copies of data, more if required by the Architect. Coordinate with Architect and Engineer to verify if Electronic Submittals, i.e. PDF, may be allowed 10 days prior to bidding the project. If Electronic Submittals are allowed, 2 bound hard copies, as stated below must be submitted as well as the Electronic file.
- B. Submittal Requirements:
 - 1. Review shop drawings and product data prior to submission to Engineer.

- 2. Submit only complete project submittals. Partial submittals or submittals not complying with the above requirements shall be returned to the contractor un-marked and rejected.
- Engineer's review is only to check for general conformance with the design concept of the project and general compliance with Contract Documents. No responsibility is assumed by the Engineer for correctness of dimensions, details, quantities, procedures, etc. shown on shop drawings or submittals.
- 4. In the interest of project expediency, the contractor may pre-submit long lead items for pre-approval pending prior approval of the Engineer.
 However, the Contractor shall not be relieved of including the same data as required by submittal binder and shall be included therein.
- 5. If a pre-submittal is made, provide a tab for items not included and include an explanation of why item is not included in the submittal and the expected submittal date.
- 6. PDF submittals must be searchable and tabbed per section. All devices, materials, etc. that assemble a fixture, system, etc. shall reside in the same tab.
- 7. Hard copy submittals shall be compiled in a 3-ring, hard bound, loose leaf binder. The face of the binder shall be clearly marked with the project title and number, the name of the Owner, Architect, Engineer, General Contractor and this Contractor.
- 8. Provide an index, numerically indicating all sections applicable to the submittal.
- 9. Separate binders shall be provided for HVAC, Plumbing and Fire Suppression trades.
- 10. Provide tab dividers for each section submitted.
- 11. If an item appears on the drawings not specifically covered by the specifications, provide an additional numeric tab at the end of the index detailing the item and include the submittal data in the binder. All devices, materials, etc. that assemble a fixture, system, etc. shall reside in the same tab.
- 12. All equipment included on the submittal sheets shall be marked to indicate the mark of the equipment as shown on the drawings. The equipment shall be high-lighted to clarify which items are being submitted.
- 13. When required, the contractor will be provided with an electronic copy of this section's Drawings. Shop drawing submittals shall consist of one digital copy in .dwg format and one in PDF format. The drawing's sheet sizes shall be formatted to the same size as the Contract Documents. A digital copy in PDF format shall be returned to the contractor with the Engineer's approval stamp and comments.

- 14. Verify field measurements, field construction criteria, catalog numbers, and similar data.
- 15. Notify Engineer in writing of deviations from requirements of Contract Documents at time submittals are made. A "deviation" shall be construed to mean a minor change to the sequence indicated on drawings or specification. A "deviation" is not intended to allow substitutions or product options.
- 16. Deviations in submittals from requirements of the Contract Documents are not relieved by Engineer's review of submittals, unless Engineer gives written acceptance of specific deviations.
- 17. Work may not commence until submittals have been returned with Engineer's stamp and signature indicating approval. Materials and equipment that were installed prior to being approved shall be removed and replaced with approved items at no additional cost to other parties.
- 18. Shop Drawings and or submittals requiring resubmission to the Engineer due to non-compliance with the Contract Documents and or incompleteness shall be thoroughly reviewed by the Contractor prior to delivery to the Engineer for review. The Contractor shall ensure the completeness and compliance of the submittal materials and shall reimburse the Engineer at the Engineer's standard hourly billing rate for review of submittals beyond the second submission.
- 19. Omission in shop drawings of any materials indicated in Contract Drawings, mentioned in Specifications, Scheduled or required for proper execution and completion of Work, does not relieve the Contractor from responsibility for providing such materials.

1.14 OPENINGS, CUTTING, AND PATCHING

- A. This Contractor shall coordinate required openings in the structure, walls, ceiling, floor roof, etc. with all Trades and applicable Engineers.
- B. When additional patching is required due to failure of coordination; provide the patching required to properly close openings including "put back" and painting. Patching must meet the Owner's, Architect's and all applicable Engineer's approval.
- C. When cutting and patching of the building is required due to failure to install piping, sleeves, or equipment on schedule or failure to provide the information required for openings, provide the cutting and patching as required. Patching must meet the Owner's, Architect's and Engineer's approval.

1.15 PROTECTION

- A. Equipment and material shall be completely protected from weather elements, painting, plaster, etc. until the project is completed. Damage from rust, paint, scratches, etc. shall be repaired as required to restore equipment to original condition. If repair is deemed unacceptable by the Owner, Architect or Engineer, the equipment, material, device, etc. shall be replaced with new at no additional cost to the Owner, Architect or Engineer.
- B. Piping within walls, in particular within studs, shall be protected with 16 gauge metal cover plate, on both sides of stud, equal to Sampson HSS Stud Shoe.
- C. Where the installation or connection of equipment requires work in areas previously finished by other Contractors, the area shall be protected and not marred, soiled, or otherwise damaged during the course of such work. Contractor shall arrange with all other Contractors for repairing and refinishing of such areas which may be damaged.
- D. When welding is required inside the building, a fire watch shall be provided. The fire watch shall provide adequate protection of existing surfaces and observance of adjacent floors where penetrations exist or are to be made.

1.16 WIRING FOR EQUIPMENT

- A. Division 22 shall provide all motors, controllers and contactors for equipment furnished under this Division, except where they are to be provided under another Division. Coordinate among all Trades prior to bidding project.
- B. Electrical work provided under Division 22 shall conform to the requirements of Division 26.
- Division 26 shall provide power for motors and equipment furnished by this Contractor including safety disconnect switches, starters and final connections. This Contractor is responsible for coordinating with the Electrical Contractor and all other Trades, for wiring that is beyond this Contractor's credentials.
- D. Include provisions required for systems controls and integration into building Life Safety and Building Automation Systems.

E. Coordinate with Division 26 for all equipment which requires electrical services. Provide information as to the exact location for rough-in, electrical load, size, and electrical characteristics for all services required.

1.17 PROTECTION OF ELECTRICAL EQUIPMENT

A. Water piping shall not be installed in electrical rooms, unless it serves the room and meets the AHJ's requirements, or directly above electrical equipment.

1.18 EXCAVATING, TRENCHING, AND BACKFILLING

- A. Provide excavation necessary for underground piping, etc. Backfill trenches and excavations after work has been installed, tested and approved. Care shall be taken in excavating, that walls and footings and adjacent load bearing soils are not disturbed, except where lines must cross under a wall footing. Where a line must pass under footing, the crossing shall be made by the smallest possible trench to accommodate the pipe. Excavation shall be kept free form water by pumping if necessary. Any open trench shall be protected with signage, fencing, etc. Trenches shall be excavated in accordance with all regulatory Codes and AHJ requirements.
- B. Trenches for piping and utilities located inside foundation walls and five (5) feet outside of the exterior wall shall be not less than sixteen (16) inches or more than twenty-four (24) inches wider than the outside diameter of the pipe to be laid. The widths of trenches for piping and utilities located more than five (5) feet outside of building foundation walls, other than for sewers, shall be governed by conditions found at the site.
- C. Pipes must be buried 24" (min.) to the top of the pipe. Grade the trench and provide 6" sand base for the pipe, with the body of the pipe supported. Bottoms of trenches shall be so shaped that when pipe is in place the lower fourth of the circumference for the full length of the pipe will be supported on compacted fill. Bell holes shall be dug so that no part of the weight of the pipe is supported by the bell but shall be no larger than necessary for proper jointing. All piping required for the structure shall be excavated to at least six (6) inches below pipe invert.

D. Immediately after testing and/or inspection, the trench shall be carefully backfilled with earth free from clods, brick, etc., to a depth one-half the pipe diameter and then firmly tamped in such a manner as not to disturb the alignment or joints of the pipe. Thereafter, the backfill shall be tamped every vertical foot.

1.19 CONCRETE WORK

- A. Provide concrete bases and housekeeping pads for equipment unless indicated otherwise. Concrete work shall be as specified in the applicable Civil and Structural Sections. Vibration pads, equipment bases, pipe supports and thrust blocks shall be provided by this Contractor.
- B. Provide equipment anchor bolts and coordinate their proper installation and accurate location.

1.20 ANCHORING OF EQUIPMENT

- A. All equipment located on floor slab that is capable of being moved shall be secured to the floor with anchor bolts. A minimum of two bolts are required per each piece of equipment and bolts shall be of sufficiently size to prevent equipment from overturning.
- B. Roof mounted equipment and curb shall be secured to the roof structure in compliance to ICC wind loading provisions.

1.21 ACCESS PANELS

- A. Access Panel shall be of appropriate size to allow for full service and removal of device behind the access panel.
- B. Provide access panels where required and not shown on the drawings for installation by the drywall or masonry Contractor. Access panels shall be steel, primed ready for paint. All access panel locations shall be approved by the Architect/Engineer.

C. Provide fire rated access panels in rated walls, ceilings and floors. Rates shall be in compliance to the assemblies rating. This Contractor shall review Life Safety Drawings for required locations of fire rated access panels.

1.22 SLEEVES

- A. Sleeves passing through non-load bearing or non-fire rated walls and partitions shall be Schedule 40 PVC pipe or cast iron pipe.
- B. Sleeves passing under or through load bearing walls, concrete beams, foundations, footings, and waterproof floors shall be Schedule 40 galvanized steel pipe. Sleeve diameter shall be a minimum of 2 pipe sizes larger than pipe being protected.
- C. Sleeves for insulated piping shall be of sufficient internal diameter to take pipe and insulation and to allow for free movement of pipe. Sleeve diameter shall be a minimum of 2 pipe sizes larger than pipe being protected. Waterproof sleeves shall be of sufficient internal diameter to take pipe and waterproofing material.
- D. In finished areas where pipes are exposed, sleeves shall be terminated flush with wall, partitions, and ceilings, and shall extend 1/2" above finished floors.
 Extend sleeves 1" above finished floors in areas likely to entrap water.

1.23 ESCUTCHEONS

A. Provide chrome plated escutcheons at each sleeved opening into finished and exposed exterior spaces. Escutcheons shall fit around insulation or around pipe when not insulated; outside diameter shall cover sleeve. Where sleeve extends above finished floor, escutcheon shall clear sleeve extension. Secure escutcheons to sleeve with set screws or other approved devices.

1.24 INSULATION PROTECTION

A. Where exposed insulated piping extends to floor, provide aluminum wrap guard around insulation. Aluminum wrap and straps shall be trimmed to eliminate sharp cutting edges.

- 1.25 CONNECTIONS FOR FIXTURES AND EQUIPMENT UNDER ANOTHER SECTION OR BY OWNER
 - A. Rough all equipment requiring connection to systems provided under this Division. Verify requirements and current locations before proceeding with work.
 - B. Make all connections to equipment furnished under another Section or by the Owner as required to obtain complete and working systems.

1.26 TEST AND DEMONSTRATIONS

- A. Systems shall be tested and placed in proper working order prior to demonstrating systems to Owner.
- B. Prior to acceptance of the installation, demonstrate to the Owner representative all features and functions of all systems installed, and instruct the Owner in the proper operation and maintenance of such systems. The Contractor shall allow for five working days and all required tools, devices, etc. to perform the demonstrations / instructions.
- C. Provide necessary trained personnel to perform the demonstrations and instructions. Provide manufacturer's representatives for systems as required to assist with the demonstrations.
- D. Dates and times for performing the demonstrations shall be coordinated with the Owner.
- E. Upon completion of demonstrations, provide a certificate testifying that demonstrations have been completed. Certificate shall list each system demonstrated, dates demonstrations were performed, names of parties in attendance, and shall be signed by the Contractor and Owner.

1.27 OBSERVATIONS OF WORK

A. The Contractor shall schedule an observation, performed by the Engineer and AHJ, one week in advance of the observation, prior to any Work being concealed, covered, etc.

- B. If the Contractor schedules an observation and the Work is found not ready or not per the Contract Documents by the Engineer, the Contractor shall reimburse the Engineer, at the Engineer's standard hourly rate, including travel time, for a follow up observation.
- C. A copy of the AHJ's report for any work observed or inspected by the AHJ shall be submitted to the Architect and Engineer.

1.28 OPERATING AND MAINTENANCE MANUALS

- A. General:
 - 1. Provide three "As Built" copies of shop drawings, product data, and other information described in this Section for use in compiling operating and maintenance manuals.
 - 2. Provide legible submittals made by permanent reproduction copy equipment from typewritten or typeset originals.
 - 3. Pre-punch 8-1/2 inch x 11 inch sheets in three ring, hardback, binders.
 - 4. Submit larger sheets in rolled, protected packages.
 - 5. Submit all in a PDF format as well as the hard copy sets mentioned above.
- B. Compilation:
 - 1. The Contractor will compile shop drawings, brochures, materials lists, technical data, warranties, guarantees, and other pertinent information and will assemble, catalog, and file information in loose-leaf, hardback three-ring binders.
 - 2. Submittal Format: Provide each of the following items, as applicable, for each required item or system. Refer to specific Specification section requirements.
 - a. Item: Use appropriate Section title.
 - b. System Description: Provide a detailed description of each system, describing function, components, capacities, controls and other data specified, and including the following:
 - 1) Quantity.
 - 2) Sizes.
 - 3) Operation.
- 4) Detailed operating instructions, including start-up and shut-down of each system, with indications for position of all controls, as applicable.
- 5) Wiring Diagrams: Complete wiring diagrams for internally wired components including controls.
- 6) Operating Sequence: Describe in detail.
- 7) Manufacturers Data: Provide catalog data sheets, specifications, nameplate data and parts list.
- 8) Preventative Maintenance: Provide manufacturer's detailed maintenance recommendations.
- 9) Troubleshooting: Provide manufacturer's sequence for trouble-shooting procedures for operational problems.
- 10) Extra Parts: Provide a listing of extra stock parts furnished as part of the Contract.
- 11) Warranties: Provide specific manufacturer's warranty. List each component and control covered, with day and date warranty begins, date of expiration and name, address and telephone number of person to contact regarding problems during warranty period.
- 12) Directory: Provide names, addresses, emails and telephone numbers of Contractor, its subcontractors, suppliers, installers and authorized service and parts suppliers.

1.29 RECORD DRAWINGS

- A. The Contractor shall record the exact locations, as installed, all equipment, pipes, and vents whether concealed or exposed which were not installed exactly as shown on the contract drawings.
- B. Upon completion of the work, this data shall be recorded to scale, by a competent CAD operator in .dwg format of no more than two versions past current. Electronic drawings in .dwg format will be furnished to the Contractor by the Architect/Engineer. Where the work was installed exactly as shown on the contract drawings the .dwg file shall not be disturbed other than being marked "As-Built." In showing the changes, the same legend shall be used to identify piping, etc., as was used on the contract drawings. Separate electronic drawings shall be prepared for plumbing, heating, air conditioning, and ventilating work unless two or more divisions are shown on the same sheets of the contract drawings, in which case the various subcontractors shall also show

their changes on the same sheets. Each sheet shall bear the date and name of the Contractor submitting the drawings.

- C. The Contractor shall review the completed As-Built drawings and ascertain that all data furnished on the .dwg files is accurate and truly represent the work as actually installed. Where plumbing, hot or chilled water pipes, inverts etc., are involved as part of the work, the Contractor shall furnish true elevations and locations, all properly referenced by using the original bench mark used for the institution or for this project.
- D. The Contractor shall not distribute the Drawings without the expressed written consent of the Engineer. The Engineer shall authorize the Contractor to produce and distribute the As-Built drawings as follows:
 - 1. One (1) to the Engineer.
 - 2. One (1) to the Architect.
 - 3. One (1) to the Owner.

1.30 SYSTEM GUARANTEE

- A. Work required under this Division shall include a one-year guarantee. Guarantee by Contractor to Owner to replace for Owner any defective workmanship or material which has been furnished under contract at no cost to the Owner, Architect or Engineer for a period of one year from date of Substantial Completion. Guarantee shall also include all reasonable adjustments of system required for proper operation during guarantee period. Guarantee shall not include normal preventative maintenance services or filters.
- B. At "Demonstration", one-year guarantee provision by Contractor shall be explained to Owner.

1.31 PAINTING AND IDENTIFICATION

- A. Touch-up paint where equipment has sustained "minor" damage shall be applied with factory provided paint and finish, to match original finish.
 Damaged shall only be deemed "minor" by the Engineer's assessment.
- B. Provide engraved, laminated plastic tags for all equipment. Tags shall be attached with permanent adhesive or pop-rivet(s).

1.32 FINISHING

- A. Prior to acceptance of the installation and final payment of the Contract, the Contractor shall perform the work outlined in the Contract Documents.
- B. At the conclusion of the construction, all portions of the project work shall be cleaned thoroughly of all debris and unused materials remaining from construction.
- C. Equipment and piping systems shall be cleaned internally. The Contractor shall open all dirt legs and remove strainers / filters, completely blowing down as required and clean strainer screens of all accumulated debris. Finished strainers, sized by the manufacturer shall be installed in place of startup strainers, filters, etc.
- D. All tanks, fixtures, and pumps shall be drained and proven free of sludge and accumulated matter.
- E. All temporary labels, stickers, etc., shall be removed from all fixtures and equipment. (Do not remove permanent name plates, equipment model numbers, ratings, etc.). Painting over equipment nameplates will not be allowed. Nameplates will be replaced with new if damaged or painted over. All equipment shall have affixed adjacent to the permanent nameplate, the unit identification on an engraved label with permanent adhesive or pop-rivet(s).
- F. Plumbing fixtures, equipment, tanks, pumps, etc., shall be thoroughly cleaned externally as well.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 220500

SECTION 220532 - SUPPORTS AND ANCHORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. Provide all materials, labor, administration and services required for complete installation of all supports and anchors indicated on Drawings and specified within this section.
- B. Vent piping, water and waste piping, vent piping appurtenances, hangers, supports and required anchors.
- C. Equipment bases, frames and supports.
- D. Flashing and sealing equipment and pipe penetrations.
- E. Sleeves and seals.

1.3 REFERENCES

- A. American Society of Mechanical Engineers (ASME)
- B. American Society of Testing and Materials (ASTM)
- C. National Fire Protection Association (NFPA)
- 1.4 WORK FURNISHED, INSTALLED UNDER OTHER SECTIONS

A. Furnish hangers and sleeve inserts for placement into formwork, framework, structure, slab, etc.

1.5 SUBMITTALS

- A. Submit shop drawings and product data for all items listed under this section.
- B. Indicate hanger / support framing and attachment methods.
- C. Provide hanger / support framing loading limits, location and load of each hanger / support frame.

1.6 SITE CONDITION

A. Do not drill, cut, burn or weld structural members in connection with the installation of pipe supports, bracing and anchorage devices, unless proposed in writing and approved in writing by the Engineer.

PART 2 - PRODUCTS

2.1 PIPE SLEEVES

- A. Sleeves Through Interior Walls, Floors and Ceilings:
 - 1. Sleeves through Non-Fire Rated floors: Schedule 40 PVC pipe.
 - 2. Sleeves through Non-Fire Rated walls, footings, and foundation walls: Schedule 40 PVC 2 pipe sizes larger than service pipe.
 - 3. Sleeves through beams shall be only in locations and of construction approved by the Structural Engineer.
 - 4. Sleeves for floor or wall penetrations at rated assemblies shall conform to Specifications Section 23 05 60.
- B. Sleeves Through Exterior Below Grade Walls, Floors and Ceilings:
 - 1. Schedule 40 Bitumen Coated Steel 2 pipe sizes larger than service pipe.

- C. Sleeves Through Exterior Above Grade Walls:
 - 1. Schedule 40 Bitumen Coated Steel 2 pipe sizes larger than service pipe. Sleeve shall extend 1/8" past finished interior and exterior of wall assembly and painted to match finished wall. Sleeve shall be sealed weather tight.
- D. Escutcheons:
 - 1. Public Areas: Solid plate stainless steel with satin finish.
 - 2. Non-Public Areas: Split ring chrome plated with set screws.
 - 3. Size: Minimum one inch annulus shall be provided except at building seismic joints. Building seismic joint pipe sleeves shall be minimum of 5 inches greater than the nominal diameter of the pipe.

2.2 FABRICATION

A. Size pipe sleeves large enough to allow for movement due to expansion and contraction and continuous insulation.

2.3 FLASHING

- A. Metal Flashing: paint grip galvanized steel.
- B. Lead Flashing: 5 lb/ft² sheet lead for waterproofing.
- C. Caps: 20 gauge minimum galvanized steel; minimum 16 gauge at fire resistant elements or as required per assembly rating. Caps shall be paint grip when exposed.

2.4 PIPE HANGERS AND SUPPORTS

- A. Provide pipe hangers, supports and guides hot-dip galvanized unless otherwise indicated. Provide copper-plated hangers on un-insulated copper pipes.
- B. Hangers and support components shall be factory fabricated materials designed.

- 1. Components shall have hot dipped galvanized coating; electroplate is not acceptable.
- 2. Strap type hangers shall not be used on any piping system; use only clevis type. The clevis hanger fastener nuts shall be nylon lock type.
- C. Anchors for pipe hanger and supports shall be either of the following types as applicable to installation condition:
 - 1. Galvanized metal inserts cast into concrete at time of placing.
 - 2. Anchor bolts for floor mounted equipment may be of a type to be placed in drilled holes and set in place with high strength cement grout.
 - 3. Wedge type, type 316 stainless steel, expansion bolts, anchor bolts set in drilled holes in accordance with manufacturer's instructions. Use of drop-in anchors are prohibited.

2.5 TYPES OF HANGERS

- A. Hangers for Cold Pipe: Carbon steel, adjustable clevis.
- B. Hangers for Hot Pipe Sizes 2 to 4 inches: Carbon steel, adjustable clevis.
- C. Hangers for Hot Pipe Sizes 6 inches and Larger: Adjustable steel yoke, cast iron roll clevis.
- D. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
- E. Vertical Support: Steel riser clamp.
- F. Copper Pipe: Carbon steel rings, adjustable, copper plated.
- G. Hanger Rods: Mild steel continuous threaded.
- H. Inserts: Malleable iron case or galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms. Size inserts to suit threaded hanger rods.

2.6 ANCHORS AND ANCHORAGE DEVICES

SUPPORTS AND ANCHORS

- A. Anchors and Bolts: Bolts and studs, nuts and washers shall be Type 316 stainless steel.
- B. Fasteners and Accessories: Provide anchors and fasteners, washers, straps and accessories required for a complete and finished installation. Fasteners shall be Type 316 stainless steel.
- C. Expansion Bolts: Where anchors are not included in the concrete or masonry construction, anchors shall be Type 316 stainless steel screws or bolts with expansion-shield type concrete or masonry anchors, of sizes and types indicated or required.

2.7 FINISH

- A. Concealed: Provide rust inhibiting primer coat to all support, hanger, anchor, etc.
- B. Exposed: Provide rust inhibiting primer coat and two finish coats, color to be selected during the submittal phase, to all support, hanger, anchor, etc.

PART 3 - EXECUTION

3.1 PIPE HANGERS AND SUPPORTS

Pipe Size	Maximum Hanger Spacing	Hanger Diameter
1/2" – 1-1/4"	6'-6"	3/8"
1-1/2" – 2"	10'-0"	3/8"
2-1/2" – 3"	10'-0"	1/2"
4" - 6"	10'-0"	5/8"
PVC (all)	4'-0"	3/8"
Pex (all)	2'-8"	3/8"
Cast Iron (all)	5'-0"	5/8"

A. Support horizontal piping as follows:

B. Install hangers to provide minimum 1/2" space between finished covering and adjacent work.

- C. Place a hanger within 12" of each elbow.
- D. Use hangers with 1-1/2" minimum vertical adjustment.
- E. Support horizontal cast iron pipe adjacent to each hub.
- F. Support vertical piping at every floor or every 10 feet whichever is more frequent.
- G. Support vertical cast iron pipe at each floor at hub.
- H. Support riser piping independently of connected horizontal piping.
- I. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
- J. All hangers, hanger rods, supports, etc. shall be double-nutted.

3.2 EQUIPMENT BASES AND SUPPORTS

- A. Provide equipment bases of concrete type, minimum 6" thick with 4" A.F.F.
- B. Provide templates, anchor bolts, and accessories for mounting and anchoring equipment.
- C. Construct support of steel members. Brace and fasten with flanges bolted to structure.
- D. Provide rigid anchors for pipes after vibration isolation components are installed in accordance with the vibration isolation manufacturer's requirements.

3.3 FLASHING

A. Flash vent and soil pipes projecting 3" minimum above finished roof surface with lead worked 1" minimum into hub, 8" minimum clear on sides. Turn flanges back into wall and caulk, metal counter flash and seal pipes through outside walls. B. Flash floor drains with lead 10" clear on sides. Fasten flashing to drain clamp device.

3.4 SLEEVES

- A. Extend sleeves through floors one inch above finished floor level. Caulk sleeves full depth and provide floor plate.
- B. Install escutcheons as described above.

END OF SECTION 220532

SECTION 220553 - PLUMBING IDENTIFICATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. Provide all materials, labor, administration and services required for complete installation of all plumbing identification indicated on Drawings and specified within this section.
- B. Identification of domestic cold, hot, recirculating water, deionizer water, industrial water, non-potable water, sanitary drain, sanitary vent, acid waste, acid vent and rain leader piping systems.
- C. Provide label maker stickers on the ceiling grid main under a water heater, pump, valve, etc. location indicating it service and / or system served.Coordinate with the Architect prior to label installation.

1.3 SUBMITTALS

A. Submit samples and manufacturer's installation instructions for all identification products used.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Pipe Markers:

PLUMBING IDENTIFICATION

- 1. Equal to Seton Snap Around Pipe Markers. Acrylic plastic with UV inhibitors. Markers shall indicate direction of flow. Legends shall be alternately reversed and repeated for viewing from any angle. Markers shall be factory formed for the installed diameter.
- B. Valve Markers:
 - Engraved Metal Tack Markers shall be provide and pop riveted to the Tee Bar main for use of identifying valve locations above acoustical tile ceilings. Color to be selected by submittal. Markers shall be numbered with standard 3/16" characters.
 - 2. Valve tags shall be Seton, 2" stamped brass tags with chain. Tag shall indicate floor served and service of respective valve.

PART 3 - EXECUTION

- 3.1 PIPING
 - A. Piping shall be identified at maximum 20 feet intervals, at each side of floor / wall penetration, and at each valve. Piping identification shall include type of service, size of pipe and direction of flow.
 - B. Piping shall be marked by the following schedule:
 - 1. Domestic Cold Water: White letters on Green.
 - 2. Domestic Hot Water: Black letters on Yellow.
 - 3. Hot Water Recirculating: Black letters on Yellow.
 - 4. Non-potable Water: Black letters on Yellow.
 - 5. Industrial Water: Black letters on Yellow.
 - 6. Sprinkler Water: White letters on Red.
 - 7. Natural Gas: Black letters on Yellow.
 - 8. Sanitary Drain: White letters on Green.
 - 9. Sanitary Vent: White letters on Green.
 - 10. Roof Drain: White letters on Green.
 - 11. Compressed Air: White letters on Blue.
 - 12. Acid Waste: Black letters on Orange.
 - 13. Medical air: Black letters on Yellow.
 - 14. Nitrogen: White letters on Black.
 - 15. Nitrous Oxide: White letters on Blue.

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- 16. Oxygen: White letters on Green.
- 17. Medical / Surgical Vacuum: Black letters on White.

END OF SECTION 220553

SECTION 220560 - THROUGH PENETRATION FIRE STOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. Provide all materials, labor, administration and services required for complete installation of all through penetration fire stopping indicated on Drawings and specified within this section.
- B. Provide fire stopping for the following through penetrations:
 - 1. Domestic hot, cold and hot water recirculation water, rain leaders, sanitary waste and vent.
 - 2. Conduit for wiring and controls.

1.3 REFERENCES

- A. Underwriters Laboratories (UL).
- B. American Society for Testing and Materials (ASTM).

1.4 CONTRACTOR REQUIREMENTS

- A. The contractor shall have at least 5 years experience with through penetration fire stopping systems and shall have completed a least 2 comparable scale projects using these systems.
- B. Provide statement from manufacturer that installer has to be trained in the proper method of installing fire stop systems

1.5 SUBMITTALS

- A. Product data including the following:
 - 1. Detailed specification of construction and fabrication installation instructions and technical data.
- B. Shop Drawings:
 - For each standard application of penetration item and surface being penetrated provide a manufacturers UL approved system cut sheet identifying the UL system number, UL classified devices or materials to be used, other materials to be used, anchorages, sleeves, annular space requirements and sizes, dimensions and locations of all items.
 - 2. For each non-standard application, provide a manufacturer's qualified engineering judgment and drawing.
 - 3. All UL approved systems shall be selected based on their rating. All systems shall provide the same ratings as the rating of the penetration, as shown on the plans.
- C. Guarantee:
 - Submit copies of written guarantee agreeing to repair or replace joint sealers which fail in joint adhesion, co-adhesion, abrasion resistance, weather resistance, extrusion resistance, migration resistance, stain resistance, or general durability or appear to deteriorate in any other manner not clearly specified by submitted manufacturer's data as an inherent quality of the material for the exposure indicated. The guarantee period shall be one year from date of substantial completion.

1.6 STORAGE

A. Coordinate delivery with scheduled installation date, allow minimum storage at site. Store and protect materials in a manner and environment per the manufacturer's requirements.

1.7 PROJECT CONDITIONS

- A. Contractor shall review and become familiar with all Drawings and / or visit the job site prior to bid, to verify wall and floor types to be penetrated. Fire ratings of walls are indicated on the Architectural Drawings. Ratings of the floors are assumed to be two (2) hours unless otherwise indicated on the Architectural Drawings.
- B. Contractor shall coordinate with the other Trades for any penetrating items that have to be routed differently than shown on the plans. Contractor shall provide fire stopping for all rerouted items whether different UL approved systems or additional materials are required.

PART 2 - PRODUCTS

2.1 THROUGH PENETRATION FIRE STOPPING

- A. Acceptable manufacturers and products shall be those listed in the UL fire resistance directory for the UL system involved.
- B. All systems and devices shall be asbestos free.
- C. All fire stopping products shall be from a single manufacturer.

PART 3 - EXECUTION

3.1 GENERAL

- A. Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
- B. Verify that penetrations are properly sized and in suitable condition for application of materials.
- C. Prepare surfaces in accordance with the fire stopping manufacturer's requirements.

3.2 INSTALLATION

- A. Install penetration seal materials in accordance with printed instructions of the U.L. Fire Resistance Directory and in accordance with manufacturer's instruction.
- B. Where floor openings without penetrating items are more than four inches in width and subject to traffic or loading, install fire stopping materials capable of supporting same loading as floor.
- C. Place non-intumescent fire stopping in annular space around fire dampers before installation of damper's anchoring flanges, which are installed in accordance with fire damper manufacturers requirements.
- D. Where large openings are created in walls or floors to permit installation of pipes, ducts, cable tray or other items, close unused portions of opening in accordance with the U.L. assembly. See U.L. Fire Resistance Directory.

3.3 ADJUSTING AND CLEANING

- A. Neatly trim materials as required.
- B. Remove equipment, materials and debris, leaving area in undamaged, clean condition.
- 3.4 FIELD QUALITY CONTROL
 - A. Examine penetration sealed areas to ensure proper installation before concealing or enclosing areas.
 - B. Keep areas of work accessible until inspection by applicable code authorities.

END OF SECTION 220560

SECTION 220710 - INSULATION FOR PLUMBING SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. Provide all labor, materials, accessories, equipment, administration and perform all operations required for the correct fabrication and installation of thermal insulation applied to the following piping systems indicated on Drawings and Specifications.
- B. Insulation work shall be performed by a competent insulation contractor whose primary business is the installation of insulation systems and who has been in this type of insulating business for a minimum of five years.
- C. Work of this section shall include the insulation for the following plumbing systems that may or may not be present on this project:
 - 1. Domestic cold, hot, hot water recirculating water and non-potable water.
 - 2. Hot water piping below grade.
 - 3. Rain Leaders including Emergency Rain Leaders.
 - 4. Traps, trap arms, cold and hot water supplies.
 - 5. Traps on condensate receiving floor / hub drains systems above grade.
 - 6. Heated or chilled equipment.

1.3 SUBMITTALS

- A. Submit product literature for each insulation and finish type, for material and or equipment served. Submit installation requirements for each type of insulation used.
- B. Product samples shall be provided at the discretion of the Engineer.

1.4 SYSTEM PERFORMANCE

- A. Insulation materials furnished shall meet the minimum thickness requirements of ASHRAE 90.1
- PART 2 PRODUCTS

2.2 THERMAL INSULATION

- A. All insulating systems shall be tested on a composite basis in accordance with:
 - 1. ASTM E-84
 - 2. NFPA 255
 - 3. UL 723
- B. All material shall be finished having a maximum flame spread rating of 25 and a maximum smoke developed rating of 50.
- C. Interior Piping:
 - 1. Rigid Fiberglass equal to Owens Corning Fiberglas ASJ and SSL II adhesive closure system.
 - 2. Closed cell, flexible electrometric thermal insulation, black in color, supplied in unslit tubing, equal to Armaflex AP 2000. Thickness shall be in accordance with ASHRAE 90.1.
- D. Interior fittings on 1/2 and 3/4 inch pipes and accessories may use job built mitered fittings of similar material as piping. Valves and fittings 1 inch and up shall use molded preformed fiberglass fittings sized for the fitting or device being insulated. All fittings and devices being insulated shall be covered with a preformed, white, snap-on type, molded PVC jacket cover. Fittings and accessories to be covered include, but not limited to, 45 and 90-degree elbows, tees, reducers, increasers, valves, check valves and unions.
- E. Equipment, tanks, etc. shall be insulated with closed cell, flexible electrometric thermal sheet insulation, black in color, equal to Armaflex AP 2000. Thickness shall be in accordance with ASHRAE 90.1.

- F. Above ground exterior piping shall be equal to Foamglass with 0.29K factor @ 75°F, maximum service temperature of 900°F and 7.5 lb/ft³ density equal to Pittsburgh Corning system with factory formed aluminum jacket.
 - 1. Fittings for above ground exterior piping shall be machine formed, routed and fitted for specific size fitting.
- G. Below ground / below slab piping shall be of same materials as F except without aluminum jacket.

2.3 INSULATION FINISH MATERIALS

- A. White All Service Jacket (ASJ).
- B. Glass fabric equal to Foster Mast-A-Fab.
- C. Smooth Aluminum 0.016-inch thickness and 0.032 inch thickness for exterior use.
- D. Aluminum fittings for elbows, tees and devices, precision formed, smooth and mar-free finish, 0.024 inches thick.

2.4 ADHESIVES

A. An air-drying contact adhesive specifically designed for joining seams and ends of Armaflex AP-2000 equal to Armstrong 520 Adhesive.

2.5 FINISHES

A. A white elastomeric, UL classified outdoor grade, vinyl mastic for finished outdoor insulation. Water based latex enamel; equal to WB Armaflex Finish.

PART 3 - EXECUTION

3.1 WORKMANSHIP

- A. All materials shall be applied by workmen skilled in this trade. Unsightly work shall be cause for rejection.
- B. Work shall be fastened, joined, adhered per the manufacturer's requirements.
- C. Materials shall be applied only after systems have been tested and all surfaces are clean and dry.
- D. Cellular glass block supports or other suitable non-compressible insulation material equal in thickness to the insulation and three times the pipe diameter in length shall be installed at hangers. Provide 18 gauge, 180 degree, galvanized sheet metal saddles under glass block supports.
- E. All joints, laps, breaks, and faults in vapor barriers of insulations covering cold surfaces, shall be thoroughly sealed.
- F. Insulation that becomes wet for any reason shall be removed, replaced and resealed at the expense of this Contractor.
- G. Piping systems requiring testing to be witnessed by the Engineer shall not be insulated until such systems have been tested and approved.
- H. Do not insulate any moving parts, valve handles, etc.
- 3.2 APPLICATION
 - A. Cold Water Insulation Application Schedule:

Pipe Size	Interior Space	Exterior Above Grade	Below Grade / Slab
1/2" - 1-1/4"	1/2"	1-1/2"	1-1/2"
1-1/2" and above	1"	2"	2"

B. Hot Water Insulation Application Schedule:

Pipe Size	Interior Space	Exterior Above Grade	Below Grade / Slab
1/2" - 1-1/4"	1"	1-1/2"	1-1/2"
1-1/2" and above	1-1/2"	2"	2"

C. Rigid Fiberglass Insulation (For interior domestic cold, hot and recirculating):

- Piping: All insulation shall be butted together and securely stapled in place (if required by the manufacturer) with outward clinching staples on 3" centers on the lapping seams. Factory provided laps of ASJ tape of same type as jacket on insulation shall be used on joints.
- 2. Fittings: Fittings shall be molded fiberglass with snap on PVC jacket and matching white tape on adjacent pipe insulation.
- 3. Insulation joints and buts shall be beveled at 30 degrees and sealed with two coats Childers CP-30.
- D. Rain Leaders and/or Emergency Rain Leaders:

Pipe Size	Exposed Conditioned Space	Exposed Non- Conditioned Space	Concealed within Building Insulation Barrier	Concealed Outside Building Insulation Barrier
3" and 4"	1"	1-1/2"	1"	2"
6" – 10"	1"	1-1/2"	1"	2"
12" – 16"	1"	1-1/2"	1"	2-1/2"
18" - 24"	1"	1-1/2"	1"	2-1/2"

1. Insulation Thickness Schedule:

- 2. Rain leaders and emergency rain leaders all portions, horizontal and vertical, are to be insulated. Insulation will continue up to the roof drain hub. The roof drain hub and pan and any area surrounding the roof drain exposed shall be insulated by this Contractor.
- 3. Piping: All insulation shall be butted together and securely stapled in place (if required by the manufacturer) with outward clinching staples on 3" centers on the lapping seams. Factory provided laps of ASJ tape of same type as jacket on insulation shall be used on joints. Exterior insulation shall be FoamGlas with aluminum jacketing.
- 4. Fittings: Fittings shall be molded fiberglass with snap on PVC jacket and matching white tape on adjacent pipe insulation.
- 5. Roof drain hubs and pans to be insulated. Miter cut the insulation to fit and glue into place.
- 6. Insulation joints and buts shall be beveled at 30 degrees and sealed with two coats Childers CP-30.
- E. Traps on Condensate Receiving Floor Drains Above Grade:

- 1. Insulation shall be cut and formed to the contours of the hub and wrapped around pipe. Factory adhesive shall be used to seal the mitered joints and connection.
- F. Storage Tanks:
 - Hot water storage tanks shall be wrapped with Owens Corning Flexwrap insulation. Cut the insulation and strip off a 3" wide strip for the overlap. Wrap the insulation around the tank and verify that the insulation is butted. Attach the 3" wide overlap with outward clinching staples spaced 3 inches O.C. Cut neatly for all penetrations and seal off any tears, joints or staples with ASJ jacket tape of same materials.
- G. Hot Water Piping Below Grade:
 - 1. Provide Foamglass insulation for underground hot water piping as specified above. Underground piping insulation shall be applied over a clean dry surface.
 - 2. Underground fittings shall be installed as described above.
- H. Cold, Hot Water, Hot Water Re-Circulating, Non-Potable Water, Rain Water and Waste Piping Above Exterior Grade Exposed and Concealed:
 - 1. Above grade exterior cold and hot water shall be insulated with Foamglass as specified above.
 - 2. Piping: All insulation shall be applied over a clean dry surface. Factory provided laps of ASJ tape of same type as jacket on insulation shall be used on butt joints. All laps and penetrations shall be sealed with a vapor barrier mastic finish.
 - 3. Fittings: Fitting insulation shall be covered with two coats of vapor barrier mastic.
 - 4. All above grade exterior piping shall be covered with aluminum jacketing. Aluminum shall be applied to a clean dry surface. Overlap butt joints 4" and apply 1/2" wide bands of aluminum on 8" O.C. and at each end of fittings. On exterior piping, the longitudinal seam shall be located at the bottom center of piping and turned 1/4" down for a drip edge. All joints on exterior piping shall be made water tight with exterior grade silicone caulking.
- I. All interior exposed piping and fittings shall be wrapped with PVC insulating jacketing equal to Pittsburg Corning Zeston 2000 and Zeston 300.

3.3 MISCELLANEOUS

- A. This Contractor will contact the Engineer prior to start of all phases of work as follows:
 - 1. Installation of underground insulation.
 - 2. Exterior above grade installation.
 - 3. Interior insulation installation.
- B. The Engineer will ascertain the continuation of work subject to the requirements aforementioned.

END OF SECTION 220710

SECTION 221110 - DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. Provide all materials, labor, administration and services required for complete installation of all domestic water piping indicated on Drawings and specified in this section.
- B. Work to Include: All domestic water service and piping to all fixtures and equipment.

1.3 REFERENCES

A. All plumbing Work shall be in accordance with the latest edition of governing codes, ordinances, and or regulations of city, county, state, utility provider, and or authority having jurisdiction. Where local codes are not applicable, conform to the latest International Code Counsel requirements.

1.4 SUBMITTALS

- A. Submit complete product and performance data for all materials listed under this section.
- B. All materials shall be new, without defect, unless specifically noted or specified otherwise.
- C. The supplier, by submitting, certifies the materials and equipment to be satisfactory for the application of this Work.

D. Contractor agrees that if deviations, discrepancies or conflicts between submittals and the Contract Documents are discovered either prior to or after submittals are processed by the Engineer, the Contract Documents shall supersede.

PART 2 - PRODUCTS

2.1 DOMESTIC WATER PIPING SYSTEM

- A. All plumbing systems shall be equipped with a pressure reducing valve at the building's water service entry. Pressure reducing valve and accessories is specified below.
- B. Buried, Exterior:
 - 1. Copper Pipe, 3-1/2" and Smaller: Type K hard drawn copper per ASTM B-88. Fittings: Wrought copper or cast brass.
 - a. Joints: Hard temper with brazed joints.
 - 2. Ductile Iron Pipe, 4" and Larger: Cement lined, per ANSI/AWWA C151/A21.51.
 - a. Joints: Shall be mechanical type.
 - 3. Buried, Exterior:
 - a. Polypropylene Pipe (All Sizes):
 - Pipe shall be manufactured from a PP-R resin meeting the shortterm properties and long-term strength requirements of ASTM F 2389. The pipe shall contain no rework or recycled materials except that generated in the manufacturer's own plant from resin of the same specification from the same raw material. All pipe shall be made in a three layer extrusion process. Domestic hot water and heating piping shall contain a fiber layer (faser) to restrict thermal expansion. All pipe shall comply with the rated pressure requirements of ASTM F 2389. All pipe shall be certified by NSF

International as complying with NSF 14, NSF 61, and ASTM F 2389 or CSA B137.11.

- 2) Underground Piping: Polypropylene (PP-R) piping in SDR 7.4.
- 3) Install hangers and supports at intervals specified in the applicable Mechanical Code and as recommended by pipe manufacturer.
- 4) Support vertical piping at each floor and as specified in the applicable Mechanical Code.
- 5) Fire stopping shall be provided to both be compatible with the Aquatherm Piping and meet the requirements of ASTM E 814 or ULC S115, "Fire Tests of Through-Penetration Firestops". Pipe insulation shall be terminated 3 to 6 inches from where the pipe passes through a fire stop, as recommended by the fire stop manufacturer.
- 6) Pipe shall be Greenpipe available from Aquatherm, Inc. or prior approved equal.
- 7) Fittings:
 - a) Fittings shall be manufactured from a PP-R resin meeting the short-term properties and long-term strength requirements of ASTM F 2389. The fittings shall contain no rework or recycled materials except that generated in the manufacturer's own plant from resin of the same specification from the same raw material. All fittings shall be certified by NSF International as complying with NSF 14, NSF 61, and ASTM F 2389 or CSA B137.11.
 - b) Install fittings and joints using socket-fusion, electofusion, or butt-fusion as applicable for the fitting type. All fusion-well joints shall be made in accordance with the pipe and fitting manufacturer's specifications and product standards.
 - c) Fusion-weld tooling, welding machines, and electrofusion devices shall be as specified by the pipe and fittings manufacturer.
 - d) Prior to joining, the pipe and fittings shall be prepared in accordance with F 2389 and the manufacturer's specifications.
 - e) Joint preparation, setting and alignment, fusion process, cooling times and working pressure shall be in accordance with the pipe and fitting manufacturer's specifications.
 - f) Fittings shall be Greenpipe available from Aquatherm, Inc. or prior approved equal.

8) Valves:

- a) Valves with PP-R bodies shall be manufactured from a PP-R resin meeting the short-term properties and long-term strength requirements of ASTM F 2389. The valves shall contain no rework or recycled materials except that generated in the manufacturer's own plant from resin of the same specification from the same raw material.
- b) Valves with brass bodies shall be manufactured in accordance with the manufacturers specifications and shall by certified by NSF International as complying with NSF 61.
- c) Valves shall be Aquatherm® Fusiotherm® available from Aquatherm, Inc. or prior approved equal.
- 9) Warranty:
 - a) Manufacturer shall warrantee pipe and fittings for 10 years to be free of defects in materials or workmanship.
 - b) Warrantee shall cover labor and material costs of repairing and/or replacing defective materials and repairing any incidental damage caused by failure of the piping system do to defects in materials or workmanship.
- b. Testing: Testing shall be performed, documented and submitted per the manufacturer's requirements.
- C. Buried Below Slab:
 - 1. Copper Pipe: Type K soft copper per ASTM B-88 with continuous protective plastic cover.
 - a. Fittings: Wrought copper or lead free cast brass.
 - b. Joints: All joints below slab shall be hard temper with brazed joints.
 - 2. PEX Piping:
 - a. PEX-A piping (SDR9 crosslinked polyethylene manufactured using the Engel method) shall be acceptable if the following is met: (Note: Clip Ring PEX will not be allowed).
 - 1) Minimum degree of cross-linking shall be between 70-89% when tested in accordance with ASTM D2765, Method B.

- 2) Manufactured in accordance with ASTM F876 and ASTM F877 and tested for compliance by an independent, third-party agency.
- 3) Piping to have a minimum material designation of PEX 5106.
- 4) Potable water piping shall comply with NSF 14 and NSF 61 and bear the "NSF-pw" marking.
- 5) Temperature and pressure requirements in accordance with PPI TR-3: 73.4° F at 80psi, 180° F at 100psi and 200° F at 80psi.
- 6) Pipe shall be PEX-A ProPex available from Uponor or prior approved equal.
- b. Joints: Manufactured Joints shall be ASTM F1960 cold-expansion type and must comply with the following:
 - 1) 20% glass-filled polysulfone as specified in ASTM D6394
 - 2) Unreinforced polysulfone (group 01, class 1, grade 2) as specified in ASTM D6394
 - 3) Polyphenylsulfone (group 03, class 1, grade 2) as specified in ASTM D6394
 - 4) Blend of polyphenylsulfone (55-80%) and unreinforced polysulfone (rem.) as specified in ASTM D6394
 - 5) Reinforcing cold-expansion rings shall be manufactured from the same source as PEX-a piping and marked "F1960".
 - 6) Potable water fittings shall comply with NSF 14 and NSF 61 and bear the "NSF-pw" marking.
 - 7) All threaded fittings shall be lead free brass.
 - 8) Fittings shall have the same inside diameter as the piping.
- D. Above Grade:
 - 1. Copper Pipe: Type L hard drawn copper per ASTM B-88.
 - a. Fittings: Wrought copper or cast brass.
 - b. Solder: Lead-free, tin-silver solder.
 - c. Notes:
 - Mechanically formed pull Tees and field brazed Tee connections will not be allowed on metallic piping. All fittings must be factory fabricated.
 - 2) Copper press fittings on above grade copper piping will be allowed. System shall be Viega "Pro-Press" system, factory copper fittings

with EPDM 'O' rings secured with factory approved crimping tools, jaws and crimp rings.

2.2 DIELECTRIC FITTINGS

- A. Insulating Material: Suitable for system fluid, pressure, and temperature.
- B. Dielectric Unions, Nipples, Couplings and Flanges:
 - 1. See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers and products. Retain one of two subparagraphs and list of manufacturers below. See Division 01 Section "Product Requirements."
 - 2. Shall be of brass material rated for applicable service. Dielectric fittings with EDPM type materials will not be allowed. The fitting will be all brass compression type.

2.3 DOMESTIC WATER SPECIALTIES

- A. Pressure Reducing Valves (PRV): All plumbing systems shall be equipped with a pressure reducing valve at the building's water service entry. PRV shall be equal to Zurn model ZW209 and shall be line size unless otherwise noted. Provide full port ball valve, union and strainer at inlet of PRV and union and full port ball valve at outlet of PRV.
- B. Backflow Preventer (BFP): All plumbing systems shall be equipped with a lead free backflow preventer at the building's water service entry. BFP shall be equal to Watts LF007 with strainer and shall be line size unless otherwise noted.
- C. Vaults (if called for on the drawings) shall be as manufactured by Eagle Wholesale series 9648, 96" x 48" x 48" deep (unless a different length is provided on the drawings), pre-cast reinforced concrete vault. Frame and lid to be Eagle series 9648 with optional hydraulically assisted two-piece aluminum doors. Door locks and hinges to be stainless steel. Frame channel to be selfdraining to grade. Drain to be installed from the frame channel horizontally thru the side of the vault. Vault shall be factory fitted with the backflow preventer and pressure reducing valve and piping thru the vault walls for connection by the Plumbing Contractor. Pipes within the vault to be class 350 cement lined ductile iron. Vault installation shall be as detailed on the

drawings. Permanent ladder / steps shall be provided within vaults deeper than 4 feet below grade.

- D. Water Hammer Arrestors (WHA): ASSE 1010; sized in accordance with PDI WH-201, piston type, suitable for operation to 250° F a maximum working pressure of 350 psig. WHA shall be Sioux Chief 650 series or prior approved equal.
- E. Provide circuit setters equal to Circuit Solver stainless steel thermostatic balancing valve.
- F. Hot water recirculation pump(s) shall be Bell & Gossett model ecocirc XL 15-75 lead free bronze body with stainless steel impeller and shaft, 1/6 HP 120/1V, 0.1 to 2.3 Amps.
- G. Thermal Expansion Tanks: Amtrol model Therm-X-Trol, or prior approved equal, bladder or diaphragm type, rated for potable water systems. Size shall be as Scheduled or indicated on the Drawings. Tank shall be ASME rated whenever the water heater or storage tank for the respective hot water system is indicated to be ASME rated.
- H. Gauge Cocks shall be brass valves with 1/4" NPT female connections and handles. Valves shall be suitable for 200 psi. Gauge Cock shall be Trerice model 865 or equal.
- I. Pressure gauges shall have type 316 stainless steel interior and exterior construction. Windows shall be glass. Gauges shall have 4" dials with white faces and black graduations. Gauge ranges shall be selected so that the normal operating point is approximately 50% but shall not exceed 75% of scale. Unit of measure shall indicate psi. All gauges shall be provided with a pulsation damper, snubber or similar device to dampen pulsation surges. Gauges shall have 1/4" NPT bottom outlets. Weiss style NF4S-2 or prior approved equal.
- J. Thermometers shall be Weiss model DVU35 or prior approved equal. Thermometer case shall be constructed of hi-impact ABS, 3/8" LCD digits, wide ambient formula, 1% of reading or 1° accuracy whichever is greater, resolution shall be 1/10° between -19.99/199.9°F, 10 second update, ambient operating range -30/140°F, glass passivated thermistor. Thermometer stem assembly shall be ASME B40.3 compliant. Sockets on insulated pipes shall have extensions of adequate length to clear insulation.

- K. Service valves 1/2" thru 4" shall be full port 1/4 turn brass ball valves, two-piece construction, threaded end connection, with PTFE seats and seals, adjustable stem packing gland, stem o-ring and steel handle with vinyl sleeve. 1/2" thru 2" valves shall be pressure rated at 600 psi WOG and 150 psi WSP. 2-1/2" and 3" valves shall be pressure rated at 600 psi WOG and 125 WSP. Valves shall be Kitz series #58 or prior approved equal. All valves shall be furnished with valve handle extensions.
- L. Check valves shall be bronze body horizontal swing wye-type with renewable seat and disc, screw cap, threaded end connections, pressure rated at 200 psi non-shock cold working pressure. Valves shall be Nibco T-413-Y-LF or prior approved equal.
- M. Strainers shall be bronze body with tapped retainer cap and closure plug, threaded end connections, 20 mesh strainer screen, pressure rated at 400 psi WOG and 125 psi WSP. Strainers shall be Watts series LF777 or prior approved equal.
- N. Piping inside chase areas shall be supported with bracketing system equal to Sioux Chief Grid Iron series. System shall include, but not be limited to, a center span bracket, two end bracket clamps and necessary retaining brackets to support the copper piping. Where piping is supported off the vent system, the vent piping shall be bracketed to the inside chase wall. Stainless steel clamps shall be incorporated into the support system when connections are made to the PVC piping.

2.4 P & T RELIEF PIPING

- A. Above Slab:
 - 1. Copper Pipe: Type L hard drawn copper per ASTM B-88. Fittings: Wrought copper or cast brass. Solder: Lead-free, tin silver solder.
 - Relief piping terminating outside the area of the installed water heater shall be installed with an air gap. The air gap shall be Watts model 909, 1" in-line type, and installed at the water heater below the T & P relief valve.

2.5 PRIMER DRAIN PIPING (WHEN APPLICABLE)

A. Above Slab:

DOMESTIC WATER PIPING

- 1. Copper Pipe: Type L hard drawn copper per ASTM B-88.
 - a. Fittings: Wrought copper or cast brass.
 - b. Joints: Lead-free, tin-silver solder.
- B. Below Slab:
 - 1. Copper Pipe: Type L soft drawn copper with no fittings or joints below the slab. Provide continuous protective plastic covering.

PART 3 - EXECUTION

3.1 GENERAL

- A. Work shall be installed so that all exposed piping will be straight and true without bends or off-sets.
- B. Water supplies shall connect through walls with stops and chrome plated escutcheons with setscrews. Split ring escutcheons will not be allowed.
- C. Installation dimensions shall be taken from the Architectural Drawings.

3.2 DOMESTIC WATER PIPING

- A. Provide a complete domestic water piping system including interior and exterior work as indicated.
- B. Piping shall be run as directly as possible, avoiding all unnecessary fittings and joints. Changes in routing of piping due to field conditions shall be at the expense of this Contractor.
- C. Piping shall be accurately cut to measurements established at the project site, worked into place without springing or forcing, run as directly as possible, run parallel or perpendicular to building lines, located as indicated on the Drawings and supported as specified elsewhere. Parallel piping shall be grouped together as much as practical. Piping shall be supported as high as practical. Piping shall be concealed unless noted otherwise.

- D. Contractor shall provide for expansion and contraction of piping systems.
 Expansion and contraction of piping shall not impart excess stress or strain on the building, pipe fittings, joints or connections to equipment.
- E. Provide sleeves for all piping penetrations under or through footings, foundation walls, grade beams, floors above grade and walls. Sleeves for insulated piping above grade shall be sized for the insulation diameter. Annular space between the insulation and sleeve shall be sealed or fire caulked as detailed on the drawings. Sleeves shall be 2 pipe sizes larger than the service pipe.
- F. Piping thru slabs on grade shall be protected with 1/2" thick Armaflex closed cell foam insulation a minimum of 6 inches above and below slab. Wrap all pipes below slab in an approved jacketing material.
- G. Piping installed below grade shall have a minimum of 24" cover. See other sections for trenching and backfill requirements.
- H. Provide solid type chrome escutcheon plates at each exposed piping penetration of walls and ceilings and inside casework.
- I. Provide shutoff valves at each branch from main. Provide shutoff valves for each fixture group to minimize interruption of service for maintenance and repair. Provide an exterior main shutoff valve and valve box as indicated on drawings. Provide area shut-off valves as necessary to facilitate testing and isolation of piping where tested and approved pipes are put into service.
- J. Piping thru metal studs, structural members, etc. shall be isolated from metal to metal contact with plastic bushings specifically designed for the application.

3.3 TRAP PRIMER DRAINS (WHEN APPLICABLE)

- A. Provide a complete system of drains as indicated on the floor plans from the primer assembly to the floor drain/hub drain connections.
- B. Piping below slabs shall be installed in the gravel bedding below the concrete flooring and held as level as possible. Piping to be sleeved with an approved protective covering.

3.4 TESTING

- A. Water piping systems shall be subjected to a hydrostatic test of 125psig or 1-1/2 times operating pressure whichever is greater.
- B. All piping shall be tested before being insulated or concealed. Where leaks or defects develop, required corrections shall be made and tests repeated until systems are proven satisfactory.
- C. Provide test report showing all field tests performed to prove compliance with the specified criteria. The testing report shall be bound or submitted in PDF format. Report shall be submitted and approved prior to final payment. The report shall include the following:
 - 1. Date of test.
 - 2. Persons present.
 - 3. System tested.
 - 4. Test medium.
 - 5. Pressure tested.
 - 6. Lines tested and location.
 - 7. Duration of test.
 - 8. Pressure drop.
- D. This Contractor shall conduct all specified tests until approved by the Engineer. All tests shall be repeated until approved by the Engineer. Piping systems shall not be covered or otherwise concealed until tests inspections have been made and approvals obtained. This Contractor shall notify the Engineer four days prior to testing to allow for scheduling. If the Engineer is called for an observation and the Engineer finds the work not ready or the test failed, this Contractor shall reimburses the Engineer at the Engineer's standard hourly rate.

3.5 STERILIZATION OF DOMESTIC WATER PIPING SYSTEM

- A. The entire system shall be flushed for a minimum of two hours and then drained prior to sterilizing by the following method or other methods satisfactory to the Engineer and the Authority Having Jurisdiction.
- B. Fill piping system with a 50 ppm chlorine solution. Open and close all valves to thoroughly distribute solution thru all piping. Allow solution to stand for 24

hours then test for residual chlorine at the ends of the system. If less than 25 ppm is indicated, repeat the sterilization process. When tests show at least 25 ppm of residual chlorine, flush out the system until all traces of chlorine is removed. Open and close all valves in system several times during flushing period.

- C. The Engineer reserves the right to test, or have, the water tested again at any time prior to final acceptance of the work. If found to be unsafe, the Contractor shall re-chlorinate the system until the water is proven equal to that supplied by the public system. It is the responsibility of this Contractor to ensure the water is equal to that supplied by the public system.
- D. Contractor shall arrange for laboratory testing for a bacteriological examination of potable water system at various locations. The samples shall be tested to meet requirement of the AHJ and shall not be of less quality than provided by the public system. Submit a copy from testing agency prior to submitting for final payment.
- E. Minor work such as repairs or replacement of a single fitting or valve, shall be pre-cleaned and disinfected by immersion in solution of 300 ppm chlorine for 1 hour.

3.6 FINAL ACCEPTANCE

A. Before final acceptance, this Contractor shall furnish a certificate of inspection and final approval from the AHJ to the Owner and be in accordance with the latest revisions of the applicable Codes and the Approved Plumbing Drawings and Specifications. Contractor shall also furnish report of test, sterilization compliance and backflow device(s) certificates.

END OF SECTION 221110
SECTION 221310 - SANITARY SEWER PIPING SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. Provide all labor, materials, accessories, equipment, administration and perform all operations required for the correct installation of all sanitary sewer piping systems indicated on Drawings and specified in this section.
- B. Work Included: All sanitary sewer piping and equipment indicated throughout the building and extension of the sanitary sewer to the indicated termination point.

1.3 REFERENCES

A. All plumbing installation and fabrication shall be in accordance with applicable State and Local Plumbing Codes.

1.4 SUBMITTALS

- A. Submit catalog data and Shop Drawings for all materials and equipment listed under this section. Include submittal data on related specifications as applicable.
- B. Materials or equipment installed without review or after rejection shall be replaced with new by this contractor at no additional cost to other parties.
- C. All materials and equipment shall be new and without defect unless specifically noted or specified otherwise.

- D. The supplier certifies the materials and equipment to be satisfactory for the application involved.
- E. The Contractor agrees that if deviations, discrepancies or conflicts between submittals and specifications are discovered either prior to or after submittals are processed by the Engineer, the Contract Documents shall supersede.

PART 2 - PRODUCTS

2.1 SANITARY SEWER PIPING SYSTEM

- A. Buried, Exterior and Below Slab:
 - 1. Cast Iron Pipe: ASTM A-74 spun service weight.
 - a. Fittings: Cast iron.
 - b. Joints: Hub-and-spigot, compression type with ASTM C-564 neoprene gaskets.
 - 2. PVC Pipe and Fittings: Schedule 40 per ASTM D-1785 / ASTM D-2665.
 - a. Joints: Solvent weld per ASTM D-2855 with solvent per ASTM D-2564.
 - 3. Provide sleeves for all piping penetrations under or through footings, foundation walls, grade beams, floors above grade and walls. Sleeves for insulated piping above grade shall be sized for the insulation diameter. Annular space between the insulation and sleeve shall be sealed or fire caulked as detailed on the drawings. Sleeves shall be 2 pipe sizes larger than the service pipe. Coordinate with the Architectural and Structural drawings for locations.
 - 4. This Contractor shall provide and install all cast iron pipe for all kitchen waste systems.
- B. Above Slab, Interior:

- Cast Iron Pipe: ASTM A-888 spun service weight. Cast iron fittings and joints shall be no hub. Couplings shall be CISPI Standard No. 310-95 with corrugated stainless steel shield and 4 stainless steel retaining bands with 5/16" worm gear hex head socket. Couplings shall be Husky HD 2000.
- PVC Pipe and Fittings: Schedule 40 per ASTM D-1785 / ASTM D-2466.
 a. Joints: Solvent weld per ASTM D-2855 with solvent per ASTM D-2564.
- 3. This Contractor shall provide and install all cast iron pipe at all fire rated assemblies, continuous floor to floor through assemblies. This Contractor shall provided and install cast iron pipe in return air plenums and where indicated on the Drawings. This Contractor shall coordinate with Contract Documents for compliance. This Contractor shall provide and install all cast iron pipe for all kitchen waste systems.

2.2 SANITARY SEWER SPECIALTIES

A. Cleanouts: Cleanouts shall be the same nominal size as the pipe served up to 4" and not less than 4" for line sizes greater than 4".

2.3 SANITARY SEWER SYSTEM INSULATION

A. All sanitary piping exposed in or installed over unheated spaces shall be insulated. Exposed floor drain bodies and P-traps shall be insulated.

PART 3 - EXECUTION

3.1 GENERAL

A. Installation dimensions between partitions or walls shall be acquired from the Architectural Drawings. Work shall be roughed-in so that all exposed piping will be straight and true without bends or off-sets.

3.2 SANITARY SEWER PIPING SYSTEM

A. Provide a complete system of sanitary sewer drain, waste and vent piping including interior and exterior work as indicated.

- B. Piping up to 2-1/2" shall be sloped at least 1/4" inch per foot. Piping 3", 4" and 6" shall be sloped at least 1/8 inch per foot. Piping 8" and larger shall be sloped at least 1/16 inch per foot.
- C. Provide cleanouts as required by Code and as indicated on the Drawings. Provide two way exterior cleanouts within 5 feet of the building. Interior cleanouts in floors shall be flush with finished floors. Interior cleanouts in walls shall be above the flood level of plumbing fixtures. Exterior cleanouts in unpaved areas and areas paved with other than concrete shall be set in concrete pads flush with finished grade as detailed on the drawings. All Clean Outs are to be the same size as the pipe they serve.
- D. Vents through roof shall be a minimum of 3 inches in diameter and shall terminate at least 12 inches above the roof. This Contractor shall review all Drawings and ensure vent termination is a minimum of 10 feet from any door, window or outside air inlet.
- E. Drainage piping shall be installed with hubs upstream of each pipe section. Provide reducing fittings where different sizes of pipe are to be connected. Bushings shall not be used. Provide longsweep fittings, sanitary tees and combination wyes with 1/8 bends as applicable.
- F. Escutcheons shall be provided on exposed wall penetrations. Escutcheons shall completely cover the piping, insulation and penetration. Escutcheon shall be single piece construction with chrome finish.
- G. Interior wall cleanouts shall have stainless steel wall covers sized for the cleanout and covering the wall opening. Cleanout covers shall be installed flush with the wall.
- H. Back to back water closets shall be installed with double combination wye with 1/8- bend. Double sanitary tees and double fixture fitting will not be allowed.

3.3 TESTING

A. All piping shall be tested before being insulated or concealed in any manner. Where leaks or defects develop, required corrections shall be made and tests repeated until systems are proven satisfactory.

- B. All waste and vent piping shall be subjected to a hydrostatic test of not less than a 10-foot head. Piping shall be tested for not less than 4 hours, prior to installing fixtures. Underground piping shall be tested before backfilling.
- C. All vent piping shall be smoke tested.

3.4 CLEANING

A. At completion of all work, fixtures, exposed materials and equipment shall be thoroughly cleaned.

3.5 FINAL ACCEPTANCE

- A. Before final acceptance, the Plumbing Contractor shall furnish a certificate of inspection and final approval from the AHJ to the Owner and be in accordance with the latest revisions of the applicable codes and the approved Plumbing Drawings and Specifications. Contractor shall also furnish a report of test and backflow device certificates.
- B. Provide test report showing all field tests performed to prove compliance with the specified criteria. The testing report shall be bound or submitted in PDF format. Report shall be submitted and approved prior to final payment. The report shall include the following:
 - 1. Date of test.
 - 2. Persons present.
 - 3. System tested.
 - 4. Test medium.
 - 5. Pressure tested.
 - 6. Lines tested and location.
 - 7. Duration of test.
 - 8. Pressure drop.
- C. This Contractor shall conduct all specified tests until approved by the Engineer. All tests shall be repeated until approved by the Engineer. Piping systems shall not be covered or otherwise concealed until tests inspections have been made and approvals obtained. This Contractor shall notify the Engineer four days prior to testing to allow for scheduling. If the Engineer is called for an

observation and the Engineer finds the work not ready or the test failed, this Contractor shall reimburse the Engineer at the Engineer's standard hourly rate.

END OF SECTION 221310

SECTION 224210 - PLUMBING FIXTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

A. Provide all fixtures, labor, materials, equipment, administration, balancing and services required for complete installation of all plumbing fixtures indicated on Drawings and specified within this section.

1.3 REFERENCES

A. All plumbing installation and fabrication shall be in accordance with applicable State and Local Plumbing Codes and project funding requirements.

1.4 SUBMITTALS

- A. Submit catalog data and shop drawings for all materials and equipment listed under this section.
- B. Materials, fixtures, or equipment installed without review or after rejection shall be replaced by this Contractor with Basis of Design items.
- C. All materials, equipment, and appliances shall be new, without defect, first line quality unless specifically noted or specified otherwise.
- D. The supplier, by submitting, certifies the materials and equipment to be satisfactory for the application involved.

E. Contractor further agrees that if deviations, discrepancies or conflicts between submittals and specifications are discovered either prior to or after submittals are processed by the Engineer, the design drawings and specifications shall supersede.

PART 2 - PRODUCTS

2.1 PLUMBING FIXTURES – GENERAL

- A. Provide all plumbing fixtures complete with trim required, and connect in a manner conforming to the Local, State and International Building Codes. Certain fixtures may be furnished by others under other sections of these Specifications. Provide rough-in and final connections including all valves, traps, specialties, etc. required.
- B. Provide traps for all waste connections where not furnished with the equipment and stop cocks or valved shut-offs for all water connections to all sinks and other items of equipment. All exposed pipe and metal, including that within cabinets, shall be chrome plated cast brass with the same gauge thickness as the specified trap. Stainless steel bell escutcheons shall be installed covering the hub connections below sinks and lavatories and extend to the wall or back of cabinet for a tight fit.
- C. Quality and Type of Fixtures:
 - 1. Plumbing fixtures, carriers, etc. are specified by manufacture and model numbers for the purpose of establishing type and quality. Equals must be pre approved by the Engineer. Pre approval submittals must be received by this office no later than 10 working days before the job bids.

2.2 FIXTURE SCHEDULE

A. P-1 Hand Sink: Existing to be relocated. Plumbing Contractor shall furnish and install HW & CW & Waste Piping. Provide and install McGuire No. 155WC offset grid drain, 17-gauge cast brass chrome plated trap with cleanout and Zurn Z-8804-LR supplies with stops. Insulate the water and waste pipes below the lavatory with TrueBro Lav Guard 2 E-Z series molded vinyl covering, white finish, latex paintable, with reusable internal snap clip fasteners. Provide Powers LFLM495 series, point of use mixing valve with a maximum discharge temperature of 105° F to 109° F. Mount mixing valve to wall. Mixing valve shall not be installed loose.

- B. P-2 Single Compartment Scullery Sink: Sink, Faucet and accessories provided by Kitchen Equipment Supplier. Provide and install Zurn Z-8825-LR-LK supplies with stops, Powers LFLM495 series point of use mixing valve with a maximum discharge temperature of 120° F or as directed by the Owner. Provide copper drain manifold to floor sink.
- C. P-3 Dishwasher: To be provided by Kitchen Equipment Supplier. Plumbing Contractor to provide and install 3/4" hot water connection with type B water hammer arrestor. Piping shall be in the wall and the water hammer arrestor shall be located above the ceiling. Provide full port shut off valve at wall for each connection. Coordinate with Kitchen Equipment Supplier for final connection requirements and provide / install piping from valve to appliance. Route Type L copper drain tight to wall to floor sink.
- D. P-4 Water Supply Wall Box: Sioux Chief 696RG1010 fire rated recessed outlet wall box with faceplate with Lead Free 1/4 turn valve with integral water hammer arrestor, faceplate, 1/4" connection and 18 gauge support bracket. Coordinate with Kitchen Equipment Supplier for final connection from wall box to appliance and provide / install piping from valve to appliance. Elevation of the wall box shall be as detailed on the Architectural Drawings.
- E. P-5 Floor Sink: Zurn model ZN-1902-KC-4, 4" bottom outlet drain connection (or 3" connection where shown on plans), 12" x 12" x 10" deep, cast iron body, drainage flange with weep hole and clamp, porcelain enamel inside finish, grate cover shall have a center drainage opening and dome strainer. Floor Sink shall be furnished with a Trap Guard insert. See Drawings for line size. Contractor shall remove the strainer and provide a sheet metal construction cover during construction and reinstall strainer just before final observations.
- F. P-6 Disposer: Provided by other. Plumbing Contractor shall furnish and install HW & CW & Type L copper Waste Piping. Provide Zurn Z-8804-LR supplies with stops. Provide a Powers LFLM495 mixing valve mounted to the wall under the sink.
- G. P-7 Rose Reel: Provided by Kitchen Equipment Supplier. The Plumbing Contractor shall install the Hose Reel assembly and furnish the piping to the

assembly with all connected piping and flexible hose connections to the reel. The reel assembly mounting shall be coordinated with the Architect prior to piping rough-in. Coordinate with the General Contractor for all required wall blocking / supports required by the Hose Reel manufacturer.

- H. P-8 Trap Primer: Sioux Chief 695 Automatic Trap Primer Valve. Install ball valve at trap primer. Provide distribution head as required. Provide service valve at trap primer. Route 1/2" type L soft drawn copper drain with continuous plastic protective cover to floor drain(s).
- I. CO Cleanout: Provide threaded brass cap and stainless steel cover plate. Plate shall bolt into brass cap.
- J. WCO Cleanout: Provide threaded brass cap and stainless steel cover plate. Plate shall bolt into brass cap.
- K. ECO Exterior Cleanout: Zurn model Z1400-K-BP-DC, coated cast iron adjustable body with anchor flange, ductile heavy-duty scoriated secured cleanout cover and internal bronze plug. Install to the listed waste pipe with a Huskey SD4000 coupling with stainless steel connector bands.
- L. PRV Pressure Reducing Valve: Zurn 500XLYSBR 2" lead free pressure reducing valve with integral strainer. Provide a service valve upstream of the PRV and unions on each end of the PRV.

PART 3 - EXECUTION

3.1 GENERAL

- A. Obtain exact centerline rough-in dimensions between partitions or walls from the Architectural Drawings. Work shall be roughed-in so that all exposed piping will be straight and true without bends or off-sets. Water supplies shall connect through walls with stops and chrome plated escutcheons with setscrews. Where fixtures are without supporting legs or carriers secure wall hangers to bolts welded to 3/16" steel plates, mounted against walls within chases.
- B. Where backs of fixtures join wainscoting or tile, the tile shall be ground flat and the joints made close. Apply a smooth bead of paintable white caulking

compound around back of fixture at outside edge before final setting. When fixture is set, wipe compound so that joint is sealed smooth.

C. Mount fixtures to the heights above finished floor as indicated on the Architectural drawings.

3.2 CLEANING

- A. At completion of all work, fixtures, exposed materials and equipment shall be thoroughly cleaned and all temporary stickers, markings, etc. shall be removed.
- B. All strainer screens shall be removed and cleaned. All floor drain strainer screens grid pattern shall match that of the floor covering grid pattern. All lavatory and sink strainers shall align with the geometry of the fixture. This Contractor shall coordinate rough-in work with necessary Trades for compliance.

END OF SECTION 224210

SECTION 230000 - MECHANICAL SPECIFICATION COVER SHEET

- 230500 Mechanical General Provisions
- 230532 Supports and Anchors
- 230553 Mechanical Identification
- 230560 Through Penetration Fire Stopping
- 230591 Testing, Adjusting, and Balancing
- 230710 Ductwork Insulation
- 233110 Galvanized Sheet Metal Ductwork
- 234319 Electronic Air Purification Systems



SECTION 23 05 00 - MECHANICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. Provide all materials, labor, management, equipment, fixtures, start-up, fabrication, services, cleaning, testing and balancing required for complete installation of all provisions indicated on Drawings, Schedules and specified herein.
- B. This Contractor shall review all of the Contract Documents including all Drawings and Specifications of all Trades to ensure the complete implementation of Work.
- C. Where shown or noted on the Drawings or where called for in other Sections of the Contract Documents, the Contractor for this Division shall install equipment furnished by Others, and shall make required service connections. Contractor shall verify with the supplier of the equipment the requirements for the installation.
- D. Where the words "provide," "furnish," "include," or "install" are used in the Specification or on the Drawings, shall mean to furnish, install, and test complete and ready for operation, the items mentioned.
- E. Drawings for the Work are diagrammatic, to express the scope of the Work and to indicate the general arrangement and locations of the Work. Due to Drawings constraints, certain items such as pipe fittings, offsets, access panels, devices and sleeves may not be shown. This Contractor shall be responsible for confirming that the devices, piping and equipment fit the space provided. The location and sizes for pipe, fittings, sleeves, access panels and other basic items

required by Code and other sections shall be coordinated and included for the proper installation of the work.

- F. Specifications may not deal with diminutive installation requirements, parts, controls, and devices required which may be required to produce the equipment performance specified or as required to meet the equipment warranties and applicable Code. Such items shall be included, whether or not specifically called for in the Contract Documents.
- G. Coordinate with all Trades in submittal of shop drawings. Shop drawings shall be prepared to clearly indicate all applicable components. Space conditions shall be detailed to the satisfaction of all trades, subject to review and final acceptance by the Engineer. In the event that the Contractor installs work before coordinating with other trades or so as to cause any interference with work of other Trades, the necessary changes shall be made to the work to correct, at no additional cost to the Owner, Architect or Engineer.

1.3 SEISMIC RESTRAINT / PROTECTION

A. All Life Safety Rated Systems shall be seismically restrained and protected including sway bracing, flexible couplings, anchoring, etc. Unless otherwise noted on the Drawings, Specifications and or general Contract Documents, the Seismic Site Class shall be "D" and Design Category shall be "C." The seismic design shall be by a competent Professional Engineer licensed in the Project's State. The Professional Engineer responsible for the seismic design shall have no less than 5 years experience in the design of seismic protection systems. The Contractor installing the seismic protection shall have no less than 5 years experience in the installation of seismic protection systems shall meet the Contractor's Qualifications herein. Seismic designer shall coordinate with Architectural Life Safety Drawings and Structural Engineer / Drawings, prior to bid, and determine the required extent of Seismic restraint / protection.

1.4 CONTRACTORS QUALIFICATIONS

- A. The qualifications of this Contractor shall be as follows:
 - 1. Contractor must be a licensed contractor, specific to this section's Trade, in the project's State.

- 2. The Contractor shall have been in the mechanical contracting business for the last five consecutive years, under their current corporation name with more than 75% of the same corporate officers.
- 3. The Contractor shall have completed at least two projects of comparable size and scope within the past two years without receipt of a Notice to Cure.
- 4. If Contractor has received a Notice to Cure on any project, that Contractor is excluded from performing work on this project.
- 5. The Contractor's main construction and service office shall be located within 150 driving miles distance of the project site unless approval, 10 days prior to project bid date, has been issued in writing by the Owner, Architect and Engineer.
- 6. The Contractor shall provide substantiating proof of these requirements 10 days prior to project bid date. If substantiating proof is not submitted and approved, the Contractor will not be allowed to bid or work the project.
- 7. The General Contractor shall not purchase this Contractor's equipment, materials, etc. All materials, equipment, labor, etc. required to perform the Work herein shall be at the cost of this Contractor.

1.5 CODES AND STANDARDS

- A. Conform to latest edition of governing codes, ordinances, and or regulations of city, county, state, utility provider, and or authority having jurisdiction. Where local codes are not applicable, conform to the latest International Code Counsel requirements.
- B. Adopted ICC and ASCE 7 where seismic restraint / protection is required.

1.6 FEES, PERMITS, AND INSPECTIONS

- A. Secure all permits and pay all fees required in connection with the Work.
- B. Coordinate and provide such inspections as are required by the Authorities having jurisdiction over the site.
- C. Where applications are required for procuring of services to the building, prepare and file such application with the Utility Company. Furnish all information required in connection with the application in the form required by the Utility Company.

1.7 ACTIVE SERVICE

A. Existing active services; water, gas, sewer, electric, are to be located and shall be protected against damage. Do not prevent or disturb operation of active services which are to remain. If active services are encountered which require relocation, make request to authorities having jurisdiction for determination of procedures. Where existing services are to be abandoned, they shall be terminated in conformance with requirements of the Utility, Municipality or Authority having jurisdiction.

1.8 SITE INSPECTION

- A. Contractor shall inspect the site to become familiar with conditions of the site which will affect this Contractor's work and shall verify points of connection with utilities, routing of Work to include required clearances from any obstacles.
- B. Additional payment will not be provided for changes in the Work required because of Contractor's failure of said familiarization and understanding.

1.9 OPENINGS, CUTTING, AND PATCHING

- A. This Contractor shall coordinate required openings in the structure, walls, ceiling, floor roof, etc. with all Trades and applicable Engineers.
- B. When additional patching is required due to failure of coordination; provide the patching required to properly close openings including "put back" and painting. Patching must meet the Owner's, Architect's and all applicable Engineer's approval.
- C. When cutting and patching of the building is required due to failure to install piping, sleeves, or equipment on schedule or failure to provide the information required for openings, provide the cutting and patching as required. Patching must meet the Owner's, Architect's and Engineer's approval.

1.10 PROTECTION

A. Equipment and material shall be completely protected from weather elements, painting, plaster, etc. until the project is completed. Damage from rust, paint,

scratches, etc. shall be repaired as required to restore equipment to original condition. If repair is deemed unacceptable by the Owner, Architect or Engineer, the equipment, material, device, etc. shall be replaced with new at no additional cost to the Owner, Architect or Engineer.

- B. Piping within walls, in particular within studs, shall be protected with 16 gauge metal cover plate, on both sides of stud, equal to Sampson HSS Stud Shoe.
- C. Where the installation or connection of equipment requires work in areas previously finished by other Contractors, the area shall be protected and not marred, soiled, or otherwise damaged during the course of such work. Contractor shall arrange with all other Contractors for repairing and refinishing of such areas which may be damaged.
- D. When welding is required inside the building, a fire watch shall be provided. The fire watch shall provide adequate protection of existing surfaces and observance of adjacent floors where penetrations exist or are to be made.

1.11 WIRING FOR EQUIPMENT

- A. Electrical work provided under Division 23 shall conform to the requirements of Division 26.
- B. Division 26 shall provide power for motors and equipment furnished by this Contractor including safety disconnect switches, starters and final connections. This Contractor is responsible for coordinating with the Electrical Contractor and all other Trades, for wiring that is beyond this Contractor's credentials.
- C. Division 23 shall provide all motors, controllers and contactors for equipment furnished under this Division, except where they are to be provided under another Division.
- D. Include provisions required for integration into building Life Safety and Building Automation Systems.
- E. Coordinate with Division 26 for all equipment which requires electrical services. Provide information as to the exact location for rough-in, electrical load, size, and electrical characteristics for all services required.

F. Where motors or equipment furnished require larger services or services of different electrical characteristics than those called for on the Electrical Drawings, this Contractor shall coordinate with the Electrical Contractor and the Electrical Engineer to provide a larger service as required, the cost of which shall be the responsibility of this Contractor.

1.12 SUBSTITUTIONS

- A. Any equipment, material, etc. submitted as "equal" to the basis of design shall be accompanied with a "one – to – one" comparison letter from the vender stating any differences from the equipment being submitted and the basis of design. A letter is also to be submitted from the vender, on the vender's letterhead, stating that the vender has received a copy of the job all Specifications, Addendums and Drawings.
- B. Substitutions for the scheduled and specified equipment shall only be done with the prior approval of the Engineer, and shall be obtained in writing. Prior approvals shall be obtained no less than 10 days prior to the project bid date.
 Prior approval shall not relieve the contractor of supplying equipment that meets the specifications, capacities, efficiencies, physical dimensions, etc.

1.13 SUBMITTALS

- A. General:
 - 1. Submit to Engineer shop drawings and product data required by the Drawings and Specifications.
 - 2. Contractor shall compile all data required to satisfy the Scope of Work implied by the Contract Documents.
 - Submit a minimum of 6 copies of data, more if required by the Architect. Coordinate with Architect and Engineer to verify if Electronic Submittals, i.e. PDF, will be allowed or required prior to bidding the project. If Electronic Submittals are allowed, 2 bound hard copies must be submitted as well as the Electronic file.
- B. Submittal Requirements:
 - 1. Review shop drawings and product data prior to submission to Engineer.

- 2. Submit only complete project submittals. Partial submittals or submittals not complying with the above requirements shall be returned to the contractor un-marked and rejected.
- Engineer's review is only to check for general conformance with the design concept of the project and general compliance with Contract Documents. No responsibility is assumed by the Engineer for correctness of dimensions, details, quantities, procedures, etc. shown on shop drawings or submittals.
- 4. In the interest of project expediency the contractor may pre-submit long lead items for pre-approval pending prior approval of the Engineer.
 However, the Contractor shall not be relieved of including the same data as required by submittal binder and shall be included therein.
- 5. The Contractor may turn in submittals without control drawings if they require a longer production time. All other items shall be included.
- 6. If a pre-submittal is made, provide a tab for items not included and include an explanation of why item is not included in the submittal and the expected submittal date.
- 7. PDF submittals must be searchable and tabbed per section. All devices, materials, etc. that assemble a fixture, system, etc. shall reside in the same tab.
- 8. Hard copy submittals shall be compiled in a 3-ring, hard bound, loose leaf binder. The face of the binder shall be clearly marked with the project title and number, the name of the Owner, Architect, Engineer, General Contractor and this Contractor.
- 9. Provide an index, numerically indicating all sections applicable to the submittal.
- 10. Separate binders shall be provided for HVAC, Plumbing and Fire Suppression trades.
- 11. Provide tab dividers for each section submitted.
- 12. If an item appears on the drawings not specifically covered by the specifications, provide an additional numeric tab at the end of the index detailing the item and include the submittal data in the binder. All devices, materials, etc. that assemble a fixture, system, etc. shall reside in the same tab.
- 13. All equipment included on the submittal sheets shall be marked to indicate the mark of the equipment as shown on the drawings. The equipment shall be high-lighted to clarify which items are being submitted.
- 14. When required, the contractor will be provided with an electronic copy of this section's Drawings. Shop drawing submittals shall consist of one digital copy in .dwg format and one in PDF format. The drawing's sheet sizes shall be formatted to the same size as the Contract Documents. A

digital copy in PDF format shall be returned to the contractor with the Engineer's approval stamp and comments.

- 15. Verify field measurements, field construction criteria, catalog numbers, and similar data.
- 16. Notify Engineer in writing of deviations from requirements of Contract Documents at time submittals are made. A "deviation" shall be construed to mean a minor change to the sequence indicated on drawings or specification. A "deviation" is not intended to allow substitutions or product options.
- 17. Deviations in submittals from requirements of the Contract Documents are not relieved by Engineer's review of submittals, unless Engineer gives written acceptance of specific deviations.
- 18. Work may not commence until submittals have been returned with Engineer's stamp and signature indicating approval. Materials and equipment that were installed prior to being approved shall be removed and replaced with approved items at no additional cost to other parties.
- 19. Shop Drawings and or submittals requiring resubmission to the Engineer due to non-compliance with the Contract Documents and or incompleteness shall be thoroughly reviewed by the Contractor prior to delivery to the Engineer for review. The Contractor shall ensure the completeness and compliance of the submittal materials and shall reimburse the Engineer at the Engineer's standard hourly billing rate for review of submittals beyond the second submission.
- 20. Omission in shop drawings of any materials indicated in Contract Drawings, mentioned in Specifications, Scheduled or required for proper execution and completion of Work, does not relieve the Contractor from responsibility for providing such materials.

1.14 OPERATING AND MAINTENANCE MANUALS

A. General:

- 1. Provide three "As Built" copies of shop drawings, product data, and other information described in this Section for use in compiling operating and maintenance manuals.
- 2. Provide legible submittals made by permanent reproduction copy equipment from typewritten or typeset originals.
- 3. Pre-punch 8-1/2 inch x 11 inch sheets in three ring, hardback, binders.
- 4. Submit larger sheets in rolled, protected packages.
- 5. Submit all in a PDF format as well as the hard copy sets mentioned above.

B. Compilation:

- 1. The Contractor will receive shop drawings, brochures, materials lists, technical data, warranties, guarantees, and other pertinent information and will assemble, catalog, and file information in loose-leaf, hardback three-ring binders.
- 2. Submittal Format: Provide each of the following items, as applicable, for each required item or system. Refer to specific Specification section requirements.
 - a) Item: Use appropriate Section title.
 - b) System Description: Provide a detailed description of each system, describing function, components, capacities, controls and other data specified, and including the following:
 - (1) Quantity.
 - (2) Sizes.
 - (3) Type of operation.
 - (4) Detailed operating instructions, including start-up and shut-down of each system, with indications for position of all controls, as applicable.
 - (5) Wiring Diagrams: Complete wiring diagrams for internally wired components including controls.
 - (6) Operating Sequence: Describe in detail.
 - (7) Manufacturers Data: Provide catalog data sheets, specifications, nameplate data and parts list.
 - (8) Preventative Maintenance: Provide manufacturer's detailed maintenance recommendations.
 - (9) Troubleshooting: Provide manufacturer's sequence for trouble-shooting procedures for operational problems.
 - (10)Extra Parts: Provide a listing of extra stock parts furnished as part of the Contract.
 - (11) Warranties: Provide specific manufacturer's warranty. List each component and control covered, with day and date warranty begins, date of expiration and name, address and telephone number of person to contact regarding problems during warranty period.
 - (12) Directory: Provide names, addresses, emails and telephone numbers of Contractor, its subcontractors, suppliers, installers and authorized service and parts suppliers.

1.15 RECORD DRAWINGS

- A. Detailed Requirements for Record Drawings:
 - 1. During the progress of the work, the General Contractor shall require the job superintendent for the plumbing, air conditioning, heating, ventilating, and fire protection subcontractors to record on their field sets of drawings the exact locations, as installed, of all conduits, pipes, and ducts whether concealed or exposed which were not installed exactly as shown on the contract drawings.
 - 2. Upon completion of the work, this data shall be recorded to scale, by a competent CAD operator in .dwg format of no more than two versions past current. Electronic drawings in .dwg format will be furnished to the Contractor by the Architect/Engineer. Where the work was installed exactly as shown on the contract drawings the .dwg file shall not be disturbed other than being marked "As-Built." In showing the changes, the same legend shall be used to identify piping, etc., as was used on the contract drawings. Separate electronic drawings shall be prepared for plumbing, heating, air conditioning, and ventilating work unless two or more divisions are shown on the same sheets of the contract drawings, in which case the various subcontractors shall also show their changes on the same sheets. Each sheet shall bear the date and name of the Contractor submitting the drawings.
 - 3. The Contractor shall review the completed As-Built drawings and ascertain that all data furnished on the .dwg files is accurate and truly represent the work as actually installed. Where plumbing, hot or chilled water pipes, inverts etc., are involved as part of the work, the Contractor shall furnish true elevations and locations, all properly referenced by using the original bench mark used for the institution or for this project.
 - 4. The Engineer shall authorize the Contractor to produce and distribute the As-Built drawings as follows:
 - a) One (1) to the Engineer.
 - b) One (1) to the Architect.
 - c) One (1) to the Owner.

1.16 SUBSTITUTIONS AND PRODUCT OPTIONS

- A. Products specified only by reference standard, select product meeting that standard in accordance to the projects funding requirements, i.e. Made in the USA.
- B. For products specified by naming several products or manufacturers, select any one of products and manufacturers named which complies with the schedules and / or specifications pending prior approval.
- C. For products specified, noted or scheduled stating "or equivalent," "or equal" or similar wording, submit a request for proposed substitutions for any product or manufacturer which is not specifically named for review and approval by the Engineer.
- D. For products specified by naming only one manufacturer product, the Engineer may approve a product of equal or greater quality or performance. Submittal must be received 10 days prior to project bid date accompanied with a one to one comparison letter.

1.17 SUBSTITUTION SUBMISSIONS

- A. Each substitution submittal request shall be accompanied with:
 - 1. Comprehensive data proving compliance of proposed substitution with requirements stated in the contract documents:
 - a) Product identification.
 - b) Manufacturer's literature shall identify:
 - (1) Manufacturer's name and supporting address, phone number, point of contact and email address.
 - (2) Product description.
 - (3) Reference standards.
 - (4) Performance and test data.
 - (5) Warranty information of all components.
 - c) Two projects of similar size and scope on which product has been used, and date of each installation.
 - d) Itemized comparison of the proposed substitution with product specified listing any variations.
 - e) Changes in construction schedule.

- f) Any effect of substitution on other contracts.
- g) List of changes required in any other work, products or required to be made by other Trades.
- h) Designation of availability of maintenance services, sources of replacement materials.
- B. Substitutions will not be considered for acceptance when:
 - 1. Substitution will require substantial revision of contract documents.
 - 2. They are indicated or implied on shop drawings or product data submittals without a formal request from Contractor or Supplier prior to bid.
 - 3. Information is deemed inadequate by the Engineer necessary for complete evaluation.

1.18 CONTRACTOR'S SUBSTITUTION RESPONSIBILITIES

- A. Contractor affirms that:
 - 1. Contractor has determined that the substitution is equivalent to or superior in all respects to that specified.
 - 2. Contractor will provide the same warranties and or bonds for substitution as for product specified.
 - 3. Contractor will coordinate installation of accepted substitution into the work, and will make such changes as required for the work to be complete in all respects.
 - 4. Contractor waives claims for additional costs caused by substitution which may subsequently become apparent.
- B. The Contractor shall have included all costs associated with the substitution for the specified products or materials, and that no additional cost will be incurred by any other party in order to fully incorporate the substituted item(s).
- C. The Contractor agrees to reimburse the Architect/Engineer for any architectural or engineering re-design that is required by the substitution to be fully incorporated. The reimbursement shall be at the Architect/Engineer's standard billing rate.

1.19 ENGINEER'S DUTIES

- A. Review Contractor's requests for substitutions with reasonable promptness.
- B. Notify Contractor in writing of decision to accept or reject requested substitution.

1.20 OBSERVATIONS OF WORK

- A. The Contractor shall schedule an observation, performed by the Engineer and AHJ, one week in advance of the observation, prior to any Work being concealed, covered, etc.
- B. If the Contractor schedules an observation and the Work is found not ready by the Engineer, the Contractor shall reimburse the Engineer, at the Engineer's standard hourly rate, including travel time, for a re-observation.
- C. A copy of the AHJ's report for any work observed or inspected by the AHJ shall be submitted to the Architect and Engineer.

1.21 FINISHING

- A. General: Prior to acceptance of the installation and final payment of the Contract, the Contractor shall perform the work outlined in the Contract Documents.
- B. Cleaning: At the conclusion of the construction, all portions of the project work shall be cleaned thoroughly of all debris and unused materials remaining from construction.
- C. Equipment, piping and duct systems shall be cleaned internally. The Contractor shall open all dirt legs and remove strainers / filters, completely blowing down as required and clean strainer screens of all accumulated debris. Finished strainers, sized by the manufacturer shall be installed in place of startup strainers, filters, etc.
- D. All tanks, fixtures, and pumps shall be drained and proven free of sludge and accumulated matter.
- E. All temporary labels, stickers, etc., shall be removed from all fixtures and equipment. (Do not remove permanent name plates, equipment model numbers, ratings, etc.). Painting over equipment nameplates will not be

allowed. Nameplates will be replaced with new if damaged or painted over. All equipment shall have affixed adjacent to the permanent nameplate, the unit identification on an engraved label with permanent adhesive or pop-rivet(s).

F. Plumbing fixtures, equipment, tanks, pumps, etc., shall be thoroughly cleaned externally as well.

1.22 TEST AND DEMONSTRATIONS

- A. Systems shall be tested and placed in proper working order prior to demonstrating systems to Owner.
- B. Prior to acceptance of the mechanical installation, demonstrate to the Owner or designated representatives all essential features and functions of all systems installed, and instruct the Owner in the proper operation and maintenance of such systems. The contract shall allow for five working days and all required tools, devices, etc. to perform the demonstrations / instructions.
- C. Provide necessary trained personnel to perform the demonstrations and instructions. Provide manufacturer's representatives for systems as required to assist with the demonstrations.
- D. Dates and times for performing the demonstrations shall be coordinated with the Owner.
- E. Upon completion of demonstrations, provide a certificate testifying that demonstrations have been completed. Certificate shall list each system demonstrated, dates demonstrations were performed, names of parties in attendance, and shall bear signatures of the Contractor and Owner.

1.23 PAINTING AND IDENTIFICATION

- A. Touch-up paint where equipment has sustained "minor" damage shall be applied with factory provided paint and finish, to match original finish.
 Damaged shall only be deemed "minor" by the Engineer's assessment.
- B. Provide engraved, laminated plastic tags for all equipment. Tags shall be attached with permanent adhesive or pop-rivet(s).

1.24 EXCAVATING, TRENCHING, AND BACKFILLING

- A. Provide excavation necessary for underground piping, etc. Backfill trenches and excavations after work has been installed, tested and approved. Care shall be taken in excavating, that walls and footings and adjacent load bearing soils are not disturbed, except where lines must cross under a wall footing. Where a line must pass under footing, the crossing shall be made by the smallest possible trench to accommodate the pipe. Excavation shall be kept free form water by pumping if necessary. Any open trench shall be protected with signage, fencing, etc. Trenches shall be excavated in accordance with all regulatory Codes and AHJ requirements.
- B. Trenches for piping and utilities located inside foundation walls and five (5) feet outside of the exterior wall shall be not less than sixteen (16) inches or more than twenty-four (24) inches wider than the outside diameter of the pipe to be laid. The widths of trenches for piping and utilities located more than five (5) feet outside of building foundation walls, other than for sewers, shall be governed by conditions found at the site.
- C. Bottoms of trenches shall be so shaped that when pipe is in place the lower fourth of the circumference for the full length of the pipe will be supported on compacted fill. Fitting holes shall be dug so that no part of the weight of the pipe is supported by the fitting but shall be no larger than necessary for proper jointing. All sewers and piping required for the structure shall be excavated to at least (6) inches below pipe invert.
- D. Immediately after testing and/or inspection, the trench shall be carefully backfilled with earth free from clods, brick, etc., to a depth one-half the pipe diameter and then firmly tamped in such a manner as not to disturb the alignment or joints of the pipe. Thereafter, the backfill shall be tamped every vertical foot.

1.25 CONCRETE WORK

A. Provide concrete bases and housekeeping pads for mechanical equipment unless indicated otherwise. Concrete work shall be as specified in the applicable Civil/Site and Structural Sections. Vibration pads, equipment bases, pipe supports and thrust blocks shall be provided by this Contractor. B. Provide equipment anchor bolts and coordinate their proper installation and accurate location.

1.26 ACCESS PANELS

- A. Access Panel shall be of appropriate size to allow for full service and removal of device behind the access panel.
- B. Provide access panels where required and not shown on the drawings for installation by the drywall or masonry Contractor. Access panels shall be steel, primed ready for paint. All access panel locations shall be approved by the Architect/Engineer.
- C. Provide fire rated access panels in rated walls, ceilings and floors. Rates shall be in compliance to the assemblies rating. This Contractor shall review Life Safety Drawings for required locations of fire rated access panels.

1.27 SLEEVES

- A. Sleeves passing through non-load bearing or non-fire rated walls and partitions shall be Schedule 40 PVC pipe or cast iron pipe.
- B. Sleeves passing through load bearing walls, concrete beams, foundations, footings, and waterproof floors shall be Schedule 40 galvanized steel pipe. Sleeve diameter shall be a minimum of 2 pipe sizes larger than pipe being protected.
- C. Sleeves for insulated piping shall be of sufficient internal diameter to take pipe and insulation and to allow for free movement of pipe. Sleeve diameter shall be a minimum of 2 pipe sizes larger than pipe being protected. Waterproof sleeves shall be of sufficient internal diameter to take pipe and waterproofing material.
- D. In finished areas where pipes are exposed, sleeves shall be terminated flush with wall, partitions, and ceilings, and shall extend 1/2" above finished floors.
 Extend sleeves 1" above finished floors in areas likely to entrap water.

1.28 ESCUTCHEONS

A. Provide chrome plated escutcheons at each sleeved opening into finished and exposed exterior spaces. Escutcheons shall fit around insulation or around pipe when not insulated; outside diameter shall cover sleeve. Where sleeve extends above finished floor, escutcheon shall clear sleeve extension. Secure escutcheons to sleeve with set screws or other approved devices.

1.29 INSULATION PROTECTION

A. Where exposed insulated piping extends to floor, provide aluminum wrap guard around insulation. Aluminum wrap and straps shall be trimmed to eliminate sharp cutting edges.

1.30 ANCHORING OF EQUIPMENT

- A. All equipment located on floor slab that is capable of being moved shall be secured to the floor with anchor bolts. A minimum of two bolts are required per each piece of equipment and bolts shall be of sufficiently size to prevent equipment from overturning.
- B. Roof mounted equipment and curb shall be secured to the roof structure in compliance to ICC wind loading provisions.

1.31 PROTECTION OF ELECTRICAL EQUIPMENT

A. Water piping shall not be installed in electrical rooms, unless it serves the room and meets the AHJ's requirements, or directly above electrical equipment.

1.32 CONNECTIONS FOR FIXTURES AND EQUIPMENT UNDER ANOTHER SECTION OR BY OWNER

- A. Rough all equipment requiring connection to systems provided under this Division. Verify requirements and current locations before proceeding with work.
- B. Make all connections to equipment furnished under another Section or by the Owner as required to obtain complete and working systems.

1.33 SYSTEM GUARANTEE

A. Work required under this Division shall include a minimum one-year guarantee. Guarantee by Contractor to Owner to replace any defective workmanship or material which has been furnished under this contract at no cost to the Owner, Architect or Engineer for a period of one year, or long if so specified in other sections, from date of Substantial Completion. Guarantee shall also include all reasonable adjustments to system required for proper operation during guarantee period. Guarantee shall not include normal preventative maintenance services or filters.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 230500

SECTION 230532 - SUPPORTS AND ANCHORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. Provide all materials, labor, administration and services required for complete installation of all supports and anchors indicated on Drawings and specified within this section.
- B. Ductwork, piping, equipment hangers, supports and required anchors.
- C. Equipment bases, frames and supports.
- D. Flashing and sealing equipment and pipe penetrations.
- E. Sleeves and seals.

1.3 REFERENCES

- A. American Society of Mechanical Engineers (ASME)
- B. American Society of Testing and Materials (ASTM)
- C. National Fire Protection Association (NFPA)

1.4 WORK FURNISHED, INSTALLED UNDER OTHER SECTIONS

A. Furnish hangers and sleeve inserts for placement into formwork, framework, structure, slab, etc.

1.5 SUBMITTALS

- A. Submit shop drawings and product data for all items listed under this section.
- B. Indicate hanger / support framing and attachment methods.
- C. Provide hanger / support framing loading limits, location and load of each hanger / support frame.

1.6 SITE CONDITION

A. Do not drill, cut, burn or weld structural members in connection with the installation of pipe supports, bracing and anchorage devices, unless proposed in writing and approved in writing by the Engineer.

PART 2 - PRODUCTS

2.1 PIPE SLEEVES

- A. Sleeves Through Interior Walls, Floors and Ceilings:
 - 1. Sleeves through Non-Fire Rated floors: Schedule 40 PVC pipe.
 - 2. Sleeves through Non-Fire Rated walls, footings, and foundation walls: Schedule 40 PVC 2 pipe sizes larger than service pipe.
 - 3. Sleeves through beams shall be only in locations and of construction approved by the Structural Engineer.
 - 4. Sleeves for floor or wall penetrations at rated assemblies shall conform to Specifications Section 23 05 60.
- B. Sleeves Through Exterior Below Grade Walls, Floors and Ceilings:
 - 1. Schedule 40 Bitumen Coated Steel 2 pipe sizes larger than service pipe.
- C. Sleeves Through Exterior Above Grade Walls:

- Schedule 40 Bitumen Coated Steel 2 pipe sizes larger than service pipe. Sleeve shall extend 1/8" past finished interior and exterior of wall assembly and painted to match finished wall. Sleeve shall be sealed weather tight.
- D. Escutcheons:
 - 1. Public Areas: Solid plate stainless steel with satin finish.
 - 2. Non-Public Areas: Split ring chrome plated with set screws.
 - 3. Size: Minimum one inch annulus shall be provided except at building seismic joints. Building seismic joint pipe sleeves shall be minimum of 5 inches greater than the nominal diameter of the pipe.

2.2 DUCT SLEEVES

- A. Exterior Insulated Ductwork: Galvanized steel. Parameter shall be large enough to allow for specified insulation to remain continuous through the penetration. Wall shall be sealed tight to ductwork sleeve by General Works Contractor installing wall assembly.
- B. Double Wall Spiral / Internally Insulated Ductwork: Galvanized paint grip steel.
 Wall shall be sealed tight to ductwork sleeve by General Works Contractor installing wall assembly.
- C. Sleeves for floor or wall penetrations at rated assemblies shall conform to Specifications Section 23 05 60.

2.3 FABRICATION

A. Size pipe sleeves large enough to allow for movement due to expansion and contraction and continuous insulation.

2.4 FLASHING

- A. Metal Flashing: paint grip galvanized steel.
- B. Lead Flashing: 5 lb/ft² sheet lead for waterproofing.

C. Caps: 20 gauge minimum galvanized steel; minimum 16 gauge at fire resistant elements or as required per assembly rating. Caps shall be paint grip when exposed.

2.5 PIPE HANGERS AND SUPPORTS

- A. Provide pipe hangers, supports and guides hot-dip galvanized unless otherwise indicated. Provide copper-plated hangers on un-insulated copper pipes.
- B. Hangers and support components shall be factory fabricated materials designed.
 - 1. Components shall have hot dipped galvanized coating; electroplate is not acceptable.
 - 2. Strap type hangers shall not be used on any piping system; use only clevis type. The clevis hanger fastener nuts shall be nylon lock type.
- C. Anchors for pipe hanger and supports shall be either of the following types as applicable to installation condition:
 - 1. Galvanized metal inserts cast into concrete at time of placing.
 - 2. Anchor bolts for floor mounted equipment may be of a type to be placed in drilled holes and set in place with high strength cement grout.
 - 3. Wedge type, type 316 stainless steel, expansion bolts, anchor bolts set in drilled holes in accordance with manufacturer's instructions. Use of drop-in anchors are prohibited.

2.6 TYPES OF HANGERS

- A. Hangers for Cold Pipe: Carbon steel, adjustable clevis.
- B. Hangers for Hot Pipe Sizes 2 to 4 inches: Carbon steel, adjustable clevis.
- C. Hangers for Hot Pipe Sizes 6 inches and Larger: Adjustable steel yoke, cast iron roll clevis.
- D. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.

- E. Vertical Support: Steel riser clamp.
- F. Copper Pipe: Carbon steel rings, adjustable, copper plated.
- G. Hanger Rods: Mild steel continuous threaded.
- H. Inserts: Malleable iron case or galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms. Size inserts to suit threaded hanger rods.

2.7 ANCHORS AND ANCHORAGE DEVICES

- A. Anchors and Bolts: Bolts and studs, nuts and washers shall be Type 316 stainless steel.
- B. Fasteners and Accessories: Provide anchors and fasteners, washers, straps and accessories required for a complete and finished installation. Fasteners shall be Type 316 stainless steel.
- C. Expansion Bolts: Where anchors are not included in the concrete or masonry construction, anchors shall be Type 316 stainless steel screws or bolts with expansion-shield type concrete or masonry anchors, of sizes and types indicated or required.

2.8 FINISH

- A. Concealed: Provide rust inhibiting primer coat to all support, hanger, anchor, etc.
- B. Exposed: Provide rust inhibiting primer coat and two finish coats, color to be selected during the submittal phase, to all support, hanger, anchor, etc.

PART 3 - EXECUTION

3.1 PIPE HANGERS AND SUPPORTS

A. Support horizontal piping as follows:

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Pipe Size	Maximum Hanger Spacing	Hanger Diameter
1/2" – 1-1/4"	6'-6"	3/8"
1-1/2" – 2"	10'-0"	3/8"
2-1/2" - 3"	10'-0"	1/2"
4" - 6"	10'-0"	5/8"
PVC (all)	6'-0"	3/8"
Cast Iron (all)	5'-0"	5/8"

- B. Install hangers to provide minimum 1/2" space between finished covering and adjacent work.
- C. Place a hanger within 12" of each elbow.
- D. Use hangers with 1-1/2" minimum vertical adjustment.
- E. Support horizontal cast iron pipe adjacent to each hub.
- F. Support vertical piping at every floor or every 10 feet whichever is more frequent.
- G. Support riser piping independently of connected horizontal piping.
- H. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
- I. All hangers, hanger rods, supports, etc. shall be double-nutted.

3.2 EQUIPMENT BASES AND SUPPORTS

- A. Provide equipment bases of concrete type, minimum 4" thick A.F.F.
- B. Provide templates, anchor bolts, and accessories for mounting and anchoring equipment.
- C. Construct support of steel members. Brace and fasten with flanges bolted to structure.
D. Provide rigid anchors for pipes after vibration isolation components are installed in accordance with the vibration isolation manufacturer's requirements.

3.3 FLASHING

A. Provide flexible flashing and metal counterflashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.

3.4 SLEEVES

- A. Extend sleeves through floors one inch above finished floor level. Caulk sleeves full depth and provide floor plate.
- B. Install escutcheons as described above.

END OF SECTION 230532

SECTION 230553 - MECHANICAL IDENTIFICATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. Provide all materials, labor, administration and services required for complete installation of all mechanical identification indicated on Drawings and specified within this section.
- B. Identification of equipment, piping, valves, controllers, dampers, ductwork, etc.
- C. Identification and painting of exposed mechanical piping.
- D. Identification and painting of accessible, concealed mechanical piping.

1.3 SUBMITTALS

- A. Submit samples and manufacturer's installation instructions for mechanical identification products.
- B. Submit valve chart and schedule including valve tag number, size, function, location and valve manufacturer's name and model number.
- C. Submit manufacturer's application instructions and color samples for paint products.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Nameplates: Laminated three-layer plastic with engraved white letters on black background color.
- B. Metal Tags: Brass with 1/2 inch high black filled numbers and/or letters, minimum 1-1/2 inch diameter, brass link chain and hooks.
- C. Engraved Metal Tack Markers shall be provide and pop riveted to the Tee Bar main for use of identifying VAV boxes, valves, controls devices, filter access, etc. locations above acoustical tile ceilings. Color to be selected by submittal. Markers shall be numbered with standard 3/16" characters.
- D. Paint: Gloss enamel.
- E. Stencil Paint: Semi-gloss enamel.
- F. Pipe Markers: Equal to Seton Snap Around Pipe Markers. Acrylic plastic with UV inhibitors. Markers shall indicate direction of flow. Legends shall be alternately reversed and repeated for viewing from any angle. Markers shall be factory formed for the installed diameter. Color-coded background, color of legend letter size and length of color field shall conform completely to the latest edition of ANSI A13.1. Legends shall be alternately reversed and repeated for viewing from any angle.

PART 3 - EXECUTION

3.1 GENERAL

- A. Degrease and clean surfaces to receive adhesive for identification materials.
- B. Prepare surfaces in accordance with paint manufacturer's requirements.
- C. Plastic nameplates shall be installed with corrosion resistant mechanical fasteners.
- D. Metal tags shall be installed with corrosion resistant chain.
- E. Engraved metal markers should be identified and located on as-built drawings.

- F. Provide label maker stickers on the ceiling grid main under a unit's, VAV's, fan's, filter, control damper, fire damper, control panel, valve, etc. location indicating the system or system served. Coordinate with the Architect prior to label installation.
- G. Stenciling shall produce neat, high contrast markings. Sizes of markings shall be per the following schedule:

Insulation or Pipe Size	Length of Stencil	Marking Size
3/4" - 1-1/4"	8"	1/2"
1-1/2" - 2	8"	3/4"
2-1/2" - 6"	12"	1-1/4"
8" - 10"	24"	2-1/2"
Over 10"	32"	3-1/2"
Ductwork and Equipment	-	2-1/2"

3.2 PIPING

- A. Piping shall be identified at maximum 20 feet on center, at each side of each wall penetration, at each valve and at each connection to equipment. Piping identification shall include type of service, pipe size and direction of flow.
- B. Exposed mechanical piping shall be painted with gloss enamel paint and identified per the following schedule:

Type of Service	Mark	Marker / Letter	Exposed Piping /
		Color	Lettering Color
WSHP Loop Water Supply	WSHP LWS	Green / White	Green / White
WSHP Loop Water Return	WSHP LWR	Green / White	Green / White
Chilled Water Supply	CHWS	Blue / White	Blue / White
Chilled Water Return	CHWR	Blue / White	Dark Blue / White
Condenser Water Supply	CWS	Green / White	Green / White
Condenser Water Return	CWR	Green / White	Green / White
Heating Water Supply	HWS	Red / White	Red / White
Heating Water Return	HWR	Red / White	Light Red / White
Hydronic Make-Up Water	HMUW	Brown / White	Brown / White
Evaporator Condensate	CD	Light Blue /	Purple / White
		White	
Refrigerant Lines	FREON	Green / White	White / Black

Reheat Condenser Water	RHCWS	Orange / White	Dark Orange / White
Reheat Condenser Water Return	RHCWR	Orange / White	Light Orange / White
High Pressure Steam	HPS	Blue / White	Blue / White
Low Pressure Steam	LPS	Blue / White	Blue / White
Condensate Return (Gravity)	CDR	Blue / White	Blue / White
Pumped Condensate Return	PCDR	Blue / White	Blue / White
High Pressure Condensate	НРС	Blue / White	Blue / White
Low Pressure Condensate	LPC	Blue / White	Blue / White
Compressed Air	CA - XXX PSI	Red / White	Red / White
Industrial Cold Water	ICW	Brown / White	Light Brown / White
Industrial Hot Water	IHW	Brown / White	Dark Brown / White
Natural Gas	NAT GAS – XXX PSI	Yellow / Black	Yellow / Black
Liquid Petroleum Gas	LP GAS – XXX PSI	Yellow / Black	Yellow / Black
Chemical Fume Hood Exhaust	CFHE	Purple / White	Purple / White

Note: Piping exposed in finished rooms shall be painted per the direction of the Architect / Owner.

- C. Concealed mechanical piping shall be identified with stenciled painting or snap around pipe markers.
- D. Refrigerant lines shall be labeled using snap around pipe markers.

3.3 VALVES

- A. Valves in main and branch piping shall be identified with metal tags.
- B. Provide valve chart and schedule, framed with clear plastic shield. Install at location as directed.
- C. All valve locations shall be indicated on "As-Built" Drawings.
- 3.4 AIR BLEEDS

- A. Provide air bleed chart and schedule, framed with clear plastic shield. Install at location as directed.
- B. All air bleed locations shall be indicated on "As-Built" Drawings.

3.5 DUCTWORK

A. Ductwork shall be identified with stenciled painting. Identify as to unit number, and area served.

3.6 EQUIPMENT

- A. Boilers, base mounted pumps, fans, etc., shall be identified with plastic laminated plates.
- B. Large equipment such as fluid coolers, cooling towers, chillers, horsepower rated boilers shall be identified with stenciled painting.
- C. Roof top equipment, air handling units, fans, VAVs, etc., shall be identified using plastic nameplates.
- D. Small equipment such as in-line pumps shall be identified with metal tags.
- E. Starters for mechanical equipment shall be labeled with the corresponding equipment designation using plastic nameplates.
- F. Control panels, gauges, instruments and major control components not located at control panels shall be identified with plastic nameplates.

END OF SECTION 230553

SECTION 230560 - THROUGH PENETRATION FIRE STOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. Provide all materials, labor, administration and services required for complete installation of all through penetration fire stopping indicated on Drawings and specified within this section.
- B. Provide fire stopping for the following through penetrations:
 - 1. Hydronic piping.
 - 2. Gas piping.
 - 3. Pneumatic piping.
 - 4. Refrigerant piping.
 - 5. Conduit for wiring and controls.

1.3 REFERENCES

- A. Underwriters Laboratories (UL).
- B. American Society for Testing and Materials (ASTM).

1.4 CONTRACTOR REQUIREMENTS

A. The contractor shall have at least 5 years experience with through penetration fire stopping systems and shall have completed a least 2 comparable scale projects using these systems.

B. Provide statement from manufacturer that installer has been trained in the proper method of installing fire stop systems.

1.5 PROJECT CONDITIONS

- A. Contractor shall review all Drawings and, when applicable, visit the job site prior to bid to verify wall and floor types to be penetrated. Fire ratings of walls are indicated on the Architectural Drawings.
- B. Contractor shall coordinate with all Trades for any penetrating items that have to be routed differently than shown on the plans. Contractor shall provide fire stopping for all rerouted items whether different UL approved systems or additional materials are required.

1.6 SUBMITTALS

- A. Shop Drawings:
 - 1. Provide detailed drawings with installation instruction, indicating any required accessories, per assembly penetration.
 - 2. Each system must indicate the UL approval for the particular penetration.
 - 3. Provide detailed specification of construction and fabrication installation instructions.
 - 4. Provide system performance and technical data.
 - 5. For each non-standard application, provide a manufacturer's qualified engineering judgment and drawing.
 - 6. All UL approved systems shall be selected based on their rating. All systems shall provide the same ratings as the rating of the penetration, as shown on the plans.
- B. Warranty:
 - 1. Submit copies of written manufacturer's warranty agreeing to repair or replace work due to a lack of general durability or the appearance of deterioration in any other manner not clearly specified by submitted manufacturer's data as an inherent quality of the material for the exposure indicated. The warranty period shall be one year from date of substantial completion.

1.7 STORAGE

A. Store and protect materials in a manner and environment per the manufacturer's requirements.

PART 2 - PRODUCTS

2.1 THROUGH PENETRATION FIRE STOPPING

- A. Acceptable manufacturers and products shall be those listed in the UL fire resistance directory for the UL system involved.
- B. All systems and devices shall be asbestos free.
- C. All fire stopping products shall be from a single manufacturer.

PART 3 - EXECUTION

3.1 GENERAL

- Verify on site conditions and measurements affecting the work of this Section. Verify that detrimental conditions are corrected before proceeding with installation.
- B. Prepare surfaces in accordance with the fire stopping manufacturer's requirements.

3.2 INSTALLATION

- A. Install penetration seal materials in accordance with printed instructions of the UL Fire Resistance Directory and in accordance with manufacturer's instruction.
- B. Provide non-intumescent fire stopping in annular space around fire dampers before installation of damper's retaining angles in accordance with fire damper manufacturer's requirements. Provide non-intumescent fire stopping around

the parameter of retaining angles in accordance with fire damper manufacturer's AHJ's requirements.

3.3 ADJUSTING AND CLEANING

- A. Clean any spills of liquid components.
- B. Dispose of system materials, debris and components leaving the project area undamaged and in a clean condition.
- C. Cut and trim excess materials neatly, flush with adjacent surfaces.

3.4 FIELD OBSERVATION AND QUALITY CONTROL

- A. Contractor is responsible to inspect all penetrations to verify the proper installation of the fire stopping system.
- B. Contractor shall leave work accessible for inspection of the Authority Having Jurisdiction.

END OF SECTION 230560

SECTION 23 05 91 - TESTING, ADJUSTING, AND BALANCING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

A. Provide all devices, labor, materials, equipment, administration and services required for all testing, adjusting, and balancing indicated on Drawings and specified herein.

1.3 REFERENCES

- A. Associated Air Balance Council (AABC).
- B. National Environmental Balancing Bureau (NEBB).
- C. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE).
- D. Sheet Metal and Air Conditioning Contractor's Association (SMACNA).

1.4 CONTRACTOR'S QUALIFICATIONS

- A. The T&B Contractor shall be certified by either AABC or NEBB.
- B. The T&B Contractor shall be an independent contractor from the Mechanical Contractor.
- C. The qualifications of this Contractor shall be as follows:

TESTING, ADJUSTING, AND BALANCING

- 1. Contractor must be a licensed Contractor, specific to this section's Trade, in the project's State.
- 2. The Contractor shall have been in the testing and balancing contracting business for the last five consecutive years, under their current corporation name with more than 75% of the same corporate officers.
- 3. The Contractor shall have completed at least two projects of comparable size and scope within the past two years without receipt of a Notice to Cure.
- 4. If Contractor has received a Notice to Cure on any project, that Contractor is excluded from performing work on this project.
- 5. The Contractor's main construction and service office shall be located within 60 driving miles distance of the project site unless approval, 10 days prior to project bid date, has been issued in writing by the Owner, Architect and Engineer.
- 6. The Contractor shall provide substantiating proof of these requirements 10 days prior to project bid date. If substantiating proof is not submitted and approved, the Contractor will not be allowed to bid or work the project.
- 7. The General Contractor shall not purchase this Contractor's equipment, materials, etc. All materials, equipment, labor, etc. required to perform the Work herein shall be at the cost of this Contractor.

1.5 SUBMITTALS

- A. Qualifications: Within 30 days of Contractor's Notice to Proceed, submit qualifications of agency and personnel, including a sample copy of the AABC National Performance Guaranty. If not submitted within the timeframe specified, the Engineer has the right to choose a T&B Contractor at the Contractor's expense.
- B. Strategies and Procedures Plan: Within 30 days of Contractor's Notice to Proceed, submit T&B strategies and step-by-step procedures as specified in Section 3.2, "Preparation."
- C. System Readiness Checklists: Within 30 days of Contractor's Notice to Proceed, T&B agency shall provide system readiness checklists as specified in Section 3.2, "Preparation," to be used and filled out by the installing contractors verifying that systems are ready for T&B.
- D. Examination Report: Provide a summary report of the examination review required in Section 3.1, if issues are discovered that may preclude the proper testing and balancing of the systems.

E. Certified T&B report: Within 10 working days of completion of balancing work, submit AABC or NEBB certified TAB report.

1.6 QUALITY ASSURANCE

- A. Agency Qualifications: Engage an independent T&B agency certified by AABC or NEBB.
 - 1. Supervisor: Employee of the T&B agency who is certified by AABC or NEBB as a TBE.
 - 2. Technician: Employee of the T&B agency who is certified by AABC or NEBB as a TBT.
- B. TBE shall perform the following:
 - 1. Review field data reports to validate accuracy of data and to prepare certified T&B reports.
 - 2. Certify that the T&B team complied with the approved T&B plan and the procedures referenced in this Specification.
 - 3. Certify the T&B report.
- C. TAB Report Forms: Use approved forms submitted with the Strategies and Procedures Plan.
- D. Instrumentation Type, Quantity, Accuracy, and Calibration: As described in the AABC National Standards for Total System Balance.

1.7 CONTRACTOR RESPONSIBILITIES

- A. Provide T&B agency one complete set of contract documents, change orders, and approved submittals in digital and hard copy formats.
- B. Controls contractor shall provide required BAS hardware, software, personnel and assistance to T&B agency as required to balance the systems. Controls contractor shall also provide trending report to demonstrate that systems are complete.

- C. Coordinate meetings and assistance from suppliers and contractors as required by T&B agency.
- D. Provide additional valves, dampers, sheaves and belts as required by T&B agency.
- E. Flag all manual volume dampers with fluorescent or other high-visibility tape.
- F. Provide access to all dampers, valves, test ports, nameplates and other appurtenances as required by T&B agency.
- G. Replace or repair insulation as required by T&B agency.
- H. Have the HVAC systems at complete operational readiness for T&B to begin. As a minimum, verify the following:
 - 1. Airside:
 - a) All ductwork is complete with all terminals installed.
 - b) All volume, smoke and fire dampers are open and functional.
 - c) Clean filters are installed.
 - d) All fans are operating, free of vibration, and rotating in correct direction.
 - e) VFD start-up is complete and all safeties are verified.
 - f) System readiness checklists are completed and returned to T&B agency.
 - 2. Hydronics:
 - a) Piping is complete with all terminals installed.
 - b) Water treatment is complete.
 - c) Systems are flushed, filled and air purged.
 - d) Strainers are pulled and cleaned.
 - e) Control valves are functioning per the sequence of operation.
 - f) All shutoff and balance valves have been verified to be 100% open.
 - g) Pumps are started, and proper rotation is verified.
 - Pump gauge connections are installed directly at the pump inlet and outlet flange or in discharge and suction pipe prior to any valves or strainers.
 - i) VFD start-up is complete and all safeties have been verified.
 - j) System readiness checklists are completed and returned to T&B agency.

- I. Promptly correct deficiencies identified during T&B.
- J. Maintain a construction schedule that allows the T&B agency to complete work prior to occupancy.
- PART 2 PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 GENERAL:

- A. All systems are to be tested in occupied and unoccupied, modes and set points, minimum and maximum positions and set points, CO₂ control, special control scenarios found in the Sequence of Control and all values be recorded on the Test and Balance report.
- B. Air systems are to be balanced with the Outside Air damper(s) closed and the return duct and take offs damper positions set. Once set, the outside air damper is to opened to its set point position(s) and the return grilles throughout the space be retested and values recorded to match the intent of the Contract Documents.

3.2 EXAMINATION

- A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems' designs that may preclude proper T&B of systems and equipment.
- B. Examine systems for installed balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers. Note the locations of devices that are not accessible for testing and balancing.
- C. Examine the approved submittals for HVAC systems and equipment.
- D. Examine ceiling plenums and underfloor air plenums used for supply, return, or relief air to verify that they are properly separated from adjacent areas.

- E. Examine equipment performance data including fan and pump curves.
- F. Examine HVAC equipment and verify that bearings are greased, belts are aligned and tight, clean permanent filters are installed, and controls are ready for operation.
- G. Examine terminal units, such as variable-air-volume boxes, and verify that they are accessible and their controls are connected, configured by the controls contractor and functioning.
- H. Examine strainers to verify that mechanical contractor has replaced startup screens with permanent screens and that all strainers have been cleaned.
- I. Examine two-way valves for proper installation and function.
- J. Examine three-way valves for proper installation for their intended function of diverting or mixing fluid flows.
- K. Examine heat-transfer coils for correct piping connections and for clean and straight fins.
- L. Examine air vents to verify that mechanical contractor has removed all air from all hydronic systems.

3.3 PREPARATION

- A. Prepare a T&B plan that includes:
 - 1. Equipment and systems to be tested.
 - 2. Strategies and step-by-step procedures for balancing the systems.
 - 3. Instrumentation to be used.
 - 4. Sample forms with specific identification for all equipment.
- B. Prepare system-readiness checklists, as described in the AABC National Standards for Total System Balance, for use by contractors in verifying system readiness for T&B. These shall include, at a minimum:
 - 1. Airside:

- a) All ductwork is complete with all terminals installed.
- b) All volume, smoke and fire dampers are open and functional.
- c) Clean filters are installed.
- d) All fans are operating, free of vibration, and rotating in correct direction.
- e) VFD start-up is complete and all safeties are verified.
- f) Automatic temperature-control systems are operational.
- g) Ceilings are installed.
- h) Windows and doors are installed.
- i) Suitable access to balancing devices and equipment is provided.
- 2. Hydronics:
 - a) Piping is complete with all terminals installed.
 - b) Water treatment is complete.
 - c) Systems are flushed, filled and air purged.
 - d) Strainers are pulled and cleaned.
 - e) Control valves are functioning per the sequence of operation.
 - f) All shutoff and balance valves have been verified to be 100% open.
 - g) Pumps are started and proper rotation is verified.
 - Pump gauge connections are installed directly at the pump inlet and outlet flange or in discharge and suction pipe prior to any valves or strainers.
 - i) VFD start-up is complete and all safeties are verified.
 - j) Suitable access to balancing devices and equipment is provided.

3.4 GENERAL PROCEDURES FOR TESTING AND BALANCING

- A. Perform testing and balancing on each system according to the procedures contained in the latest version of the AABC National Standards for Total System Balance and in this Section.
- B. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.
- C. Air flow balancing shall be done at the individual device, i.e. VAV Box, inlet and run-out manual dampers. Adjusting mass air flow by the Return, Outside or

Supply control dampers, i.e. VAV box damper, through a control system setpoint will not be allowed.

- D. Hydronic flow balancing shall be done at the individual device balancing valves. Adjusting flow by a control valve through a control system setpoint will not be allowed.
- E. Take and report testing and balancing measurements in inch-pound (IP) units.
- F. Test and Balance all air and water systems at occupied, unoccupied, minimum and maximum scheduled flow rates, temperatures, etc.

3.5 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

- A. Prepare test reports for both fans and outlets. Obtain approved submittals and any manufacturer-recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.
- B. Prepare a single-line schematic diagram of systems for the purpose of identifying HVAC components.
- C. For variable-air-volume systems, develop a plan to simulate diversity.
- D. Determine the best locations in main and branch ducts for accurate duct-airflow measurements.
- E. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.
- F. Verify that motor starters are equipped with properly sized thermal protection.
- G. Check condensate drains for proper connections and functioning.
- H. Check for proper sealing of air-handling-unit components.

3.6 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS

A. Adjust fans to deliver total design airflows within the maximum allowable fan speed listed by fan manufacturer.

- 1. Measure total airflow as follows:
 - a) Set outside air, return air and relief air dampers for proper position that simulates minimum outdoor air conditions.
 - b) Where duct conditions allow, measure airflow by Pitot-tube traverse. If necessary, perform multiple Pitot-tube traverses to obtain total airflow.
 - c) Where duct conditions are not suitable for Pitot-tube traverse measurements, a coil traverse may be acceptable.
 - d) If a reliable Pitot-tube traverse is not possible, measure airflowat terminals and calculate the total airflow.
- 2. Measure fan static pressures as follows:
 - a) Measure static pressure directly at the fan outlet or through the flexible connection.
 - b) Measure static pressure directly at the fan inlet or through the flexible connector.
 - c) Measure static pressure across each component that makes up the air handling system, including final filters, duct heaters, etc.
 - d) Report any artificial loading of filters at the time static pressures are measured.
- 3. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure that no overload will occur. Measure amperage in full-cooling, full-heating, economizer, and any other operating mode to determine the maximum required brake horsepower.
- B. Adjust volume dampers for main duct, sub-main ducts, and major branch ducts to indicated airflows.
 - 1. Measure airflow of sub-main and branch ducts.
 - 2. Adjust sub-main and branch duct volume dampers for specified airflow.
 - 3. Re-measure each sub-main and branch duct after all have been adjusted.
- C. Adjust air inlets and outlets for each space to indicated airflows.
 - 1. Set airflow patterns of adjustable outlets for proper distribution without drafts.
 - 2. Measure airflow at all inlets and outlets.

- 3. Adjust each inlet and outlet for specified airflow.
- 4. Re-measure each inlet and outlet after all have been adjusted.
- D. Verify final system conditions.
 - 1. Re-measure and confirm minimum outdoor air, return and relief airflows are within design. Readjust to design if necessary.
 - 2. Re-measure and confirm total airflow is within design.
 - 3. Re-measure all final fan operating data, rpms, volts, amps, static profile.
 - 4. Mark all final settings.
 - 5. Test system in economizer mode. Verify proper operation and adjust, if necessary. Measure and record all operating data.

3.7 PROCEDURES FOR VARIABLE-AIR-VOLUME SYSTEMS

- A. Adjust the variable-air-volume systems as follows:
 - 1. Verify that the system static pressure sensor is located 2/3 of the distance down the duct from the fan discharge.
 - 2. Verify that the system is under static pressure control.
 - 3. Select the terminal unit that is most critical to the supply-fan airflow. Measure inlet static pressure, and adjust system static pressure control setpoint so the entering static pressure for the critical terminal unit is not less than the sum of the terminal-unit manufacturer's recommended minimum inlet static pressure plus the static pressure needed to overcome terminal-unit discharge system losses.
 - 4. Calibrate and balance each terminal unit for maximum and minimum design airflow as follows:
 - a) Adjust controls so that terminal is calling for maximum airflow.
 - b) Measure airflow and adjust calibration factor as required for design maximum airflow. Record calibration factor.
 - c) When maximum airflow is correct, balance the air outlets downstream from terminal units.
 - d) Adjust controls so that terminal is calling for minimum airflow.
 - e) Measure airflow and adjust calibration factor as required for design minimum airflow. Record calibration factor. If no minimum calibration is available, note any deviation from design airflow.

- 5. After all terminals have been calibrated and balanced, test and adjust system for total airflow. Adjust fans to deliver total design airflows within the maximum allowable fan speed listed by fan manufacturer.
 - a) Set outside air, return air and relief air dampers for proper position that simulates minimum outdoor air conditions.
 - b) Set terminals for maximum airflow. If system design includes diversity, adjust terminals for maximum and minimum airflow so that connected total matches fan selection and simulates actual load in the building.
 - c) Where duct conditions allow, measure airflow by Pitot-tube traverse. If necessary, perform multiple Pitot-tube traverses to obtain total airflow.
 - d) Where duct conditions are not suitable for Pitot-tube traverse measurements, a coil traverse may be acceptable.
 - e) If a reliable Pitot-tube traverse or coil traverse is not possible, measure airflow at terminals and calculate the total airflow.
- 6. Measure fan static pressures as follows:
 - a) Measure static pressure directly at the fan outlet or through the flexible connection.
 - b) Measure static pressure directly at the fan inlet or through the flexible connection.
 - c) Measure static pressure across each component that makes up the airhandling system.
 - d) Report any artificial loading of filters at the time static pressures are measured.
- 7. Set final return and outside airflow to the fan while operating at maximum return airflow and minimum outdoor airflow.
 - a) Balance the return-air ducts and inlets the same as described for constant-volume air systems.
 - b) Verify all terminal units are meeting design airflow under system maximum flow.
- 8. Re-measure the inlet static pressure at the most critical terminal unit and adjust the system static pressure setpoint to the most energy-efficient setpoint to maintain the optimum system static pressure. Record setpoint and give to controls contractor.
- 9. Verify final system conditions as follows:

- a) Re-measure and confirm minimum outdoor air, return and relief airflows are within design. Readjust to design if necessary.
- b) Re-measure and confirm total airflow is within design.
- c) Re-measure all final fan operating data, rpms, volts, amps, static profile.
- d) Mark all final settings.
- e) Test system in economizer mode. Verify proper operation and adjust, if necessary. Measure and record all operating data.
- f) Verify tracking between supply and return fans.
- 10. Record final fan-performance data.

3.8 GENERAL PROCEDURES FOR HYDRONIC SYSTEMS

- A. Prepare test reports for pumps, coils and heat exchangers. Obtain approved submittals and any manufacturer-recommended testing procedures. Crosscheck the summation of required coil and heat exchanger gpms with pump design flow rate.
- B. Verify that hydronic systems are ready for testing and balancing:
 - 1. Check liquid level in expansion tank.
 - 2. Check that makeup water has adequate pressure to highest vent.
 - 3. Check that control valves are in their proper positions.
 - 4. Check that air has been purged from the system.
 - 5. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.
 - 6. Verify that motor starters are equipped with properly sized thermal protection.

3.9 PROCEDURES FOR CONSTANT-FLOW HYDRONIC SYSTEMS

- A. Adjust pumps to deliver total design gpm.
 - 1. Measure total water flow.
 - a) Position valves for full flow through coils.
 - b) Measure flow by main flow meter, if installed.

- c) If main flow meter is not installed determine flow by pump total dynamic head (TDH) or exchanger pressure drop.
- 2. Measure pump TDH as follows:
 - a) Measure discharge pressure directly at the pump outlet flange or in discharge pipe prior to any valves.
 - b) Measure inlet pressure directly at the pump inlet flange or in suction pipe prior to any valves or strainers.
 - c) Convert pressure to head and correct for differences in gauge heights.
 - d) Verify pump impeller size by measuring the TDH with the discharge valve closed. Note the point on manufacturer's pump curve at zero flow and verify that the pump has the intended impeller size.
 - e) With all valves open, read pump TDH. Adjust pump discharge valve until design water flow is achieved.
- 3. Monitor motor performance during procedures and do not operate motor in an overloaded condition.
- B. Adjust flow measuring devices installed in mains and branches to design water flows.
 - 1. Measure flow in main and branch pipes.
 - 2. Adjust main and branch balance valves for design flow.
 - 3. Re-measure each main and branch after all have been adjusted.
- C. Adjust flow measuring devices installed at terminals for each space to design water flows.
 - 1. Measure flow at all terminals.
 - 2. Adjust each terminal to design flow.
 - 3. Re-measure each terminal after all have been adjusted.
 - 4. Position control valves to bypass the coil and adjust the bypass valve to maintain design flow.
 - 5. Perform temperature tests after all flows have been balanced.
- D. For systems with pressure-independent valves at the terminals:
 - 1. Measure differential pressure and verify that it is within manufacturer's specified range.
 - 2. Perform temperature tests after all flows have been verified.

- E. For systems without pressure-independent valves or flow measuring devices at the terminals:
 - 1. Measure and balance coils by either coil pressure drop or temperature method.
 - 2. If balanced by coil pressure drop, perform temperature tests after all flows have been verified.
- F. Verify final system conditions as follows:
 - 1. Re-measure and confirm that total water flow is within design.
 - 2. Re-measure all final pump operating data, TDH, volts, amps, static profile.
 - 3. Mark all final settings.
- G. Verify that all memory stops have been set.

3.10 PROCEDURES FOR VARIABLE-FLOW HYDRONIC SYSTEMS

- A. Adjust the variable-flow hydronic system as follows:
 - 1. Verify that the differential pressure (DP) sensor is located per the contract documents.
 - 2. Determine if there is diversity in the system.
- B. For systems with no diversity:
 - 1. Follow procedures outlined in section 3.8 for constant-flow hydronic systems.
 - 2. Prior to verifying final system conditions, determine the system DP setpoint.
 - The pump discharge valve shall be used to set total system flow with VFD at 60 Hz and the VFD shall control system with respect to the DP setpoint.
 - 4. Mark all final settings and verify that all memory stops have been set.
- C. For systems with diversity:
 - 1. Determine diversity factor.
 - 2. Simulate system diversity by closing required number of control valves, as approved by the design engineer.

- 3. Follow procedures outlined in section 3.8 for constant flow hydronic systems.
- 4. Open control valves that were shut. Close a sufficient number of control valves that were previously open to maintain diversity, and balance the terminals that were just opened.
- 5. Prior to verifying final system conditions, determine the system DP setpoint.
- The pump discharge valve shall be used to set total system flow with VFD at 60 Hz and the VFD shall control system with respect to the DP setpoint.
- 7. Mark all final settings and verify that all memory stops have been set.

3.11 GENERAL PROCEDURES FOR ELECTRIC HEAT SYSTEMS

- A. Prepare test reports for electric duct, VAV and / or unit heaters. Obtain approved submittals and any manufacturer-recommended testing procedures.
- B. Verify that electric heat systems are ready for testing and balancing:
 - 1. Check air flow proving switch.
 - 2. Check heater kW, voltage and amp draw.
 - 3. Check that control dampers are in their proper positions for heating CFM.
 - 4. Check safety limits and controls.
 - 5. Check entering and leaving temperatures.
 - 6. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.
 - 7. Verify that motor starters are equipped with properly sized thermal protection.

3.12 TOLERANCES

- A. Set HVAC system's air flow rates and water flow rates within the following tolerances:
 - 1. Supply, Return, and Exhaust Fans: Plus or minus 10 percent.
 - 2. Air Outlets and Inlets: Plus or minus 10 percent.
 - 3. Minimum Outside Air: Zero to plus 10 percent.
 - 4. Maintaining pressure relationships as designed shall have priority over the tolerances specified above.
 - 5. Heating-Water Flow Rate: Plus or minus 10 percent.
 - 6. Cooling-Water Flow Rate: Plus or minus 10 percent.

3.13 FINAL TEST & BALANCE REPORT

- A. The report shall be a complete record of the HVAC system performance, including conditions of operation, items outstanding, and any deviations found during the T&B process. The final report also provides a reference of actual operating conditions for the owner and/or operations personnel. All measurements and test results that appear in the reports must be made on site and dated by the AABC technicians or test and balance engineers.
- B. The report must be organized by systems and shall include the following information as a minimum:
 - 1. Title Page:
 - a) Company Name
 - b) Company Address
 - c) Company Telephone Number
 - d) Project Identification Number
 - e) Location
 - f) Project Architect
 - g) Project Engineer
 - h) Project Contractor
 - i) Project Number
 - j) Date of Report
 - k) AABC Certification Statement
 - l) Name, Signature, and Certification Number of AABC TBE
 - 2. Table of Contents:
 - 3. AABC National Performance Guaranty
 - 4. Report Summary
 - The summary shall include a list of items that do not meet design tolerances, with information that may be considered in resolving deficiencies.
 - 5. Instrument List
 - a) Type
 - b) Manufacturer

- c) Model
- d) Serial Number
- e) Calibration Date
- 6. T&B Data
 - a) Provide test data for specific systems and equipment as required by the most recent edition of the AABC National Standards.
- C. One copy of the final test and balance report shall be sent directly to the engineer of record. Provide five (5) additional copies to the contractor.

END OF SECTION 230591

SECTION 230710 - DUCTWORK INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2 SUMMARY

A. Perform all Work required to provide and install ductwork insulation and jackets indicated by the Contract Documents with supplementary items necessary for proper installation.

1.3 REFERENCE STANDARDS

- A. The latest published edition of a reference shall be applicable to this Project unless identified by a specific edition date.
- B. All reference amendments adopted prior to the effective date of this Contract shall be applicable to this Project.
- C. All materials, installation and workmanship shall comply with the applicable requirements and standards addressed within the following references:
- D. ASTM B209 Aluminum and Aluminum-Alloy Sheet and Plate.
 - 1. ASTM C168 Terminology Relating to Thermal Insulation Materials.
 - 2. ASTM C518 Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 - 3. ASTM C553 Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
 - 4. ASTM C612 Mineral Fiber Block and Board Thermal Insulation.
 - 5. ASTM C1071 Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material).

- 6. ASTM C1104 Standard Test Method for Determining the Water Vapor Sorption of Unfaced Mineral Fiber Insulation.
- 7. ASTM C1290 Standard Specification for Flexible Fibrous Glass Blanket Insulation Used to Externally Insulate HVAC Ducts.
- 8. ASTM C1136 Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation.
- 9. ASTM C1338 Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings.
- 10. ASTM E84 Surface Burning Characteristics of Building Materials.
- 11. ASTM E96 Water Vapor Transmission of Materials.
- 12. ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials.
- 13. ASTM G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- 14. NFPA 255 Surface Burning Characteristics of Building Materials.
- 15. SMACNA HVAC Duct Construction Standards Metal and Flexible.
- 16. UL 181 Standard for Factory-Made Air Ducts and Air Connectors.
- 17. UL 723 Surface Burning Characteristics of Building Materials.
- 18. ASTM E2336 Standard for Grease Ducts.
- 19. ASTM D5590 Standard Test Method for Determining the Resistance of Paint Films and Related Coatings to Fungal Defacement by Accelerated Four-Week Agar Plate Assay

1.4 QUALITY ASSURANCE

- A. All ductwork requiring insulation shall be insulated as specified herein and as required for a complete system. In each case, the insulation shall be equivalent to that specified and materials applied and finished as described in these Specifications.
- B. All insulation, jacket, adhesives, mastics, sealers, etc., utilized in the fabrication of these systems shall meet NFPA for fire resistant ratings (maximum of 25 flame spread and 50 smoke developed ratings) and shall be approved by the insulation manufacturer for guaranteed performances when incorporated into their insulation system, unless a specific product is specified for a specific application and is stated as an exception to this requirement. Certificates to this effect shall be submitted along with Contractor's submittal data for this Section of the Specifications. No material may be used that, when tested by the ASTM E84-89 test method, is found to melt, drip or delaminate to such a degree that

the continuity of the flame front is destroyed, thereby resulting in an artificially low flame spread rating.

- C. Application Contractor Qualifications: Contractor performing the Work of this Section must have minimum five (5) years experience specializing in the trade. Insulation Contractor must be separate from the Mechanical Contractor.
- D. All insulation shall be applied by mechanics skilled in this particular Work and regularly engaged in such occupation.
- E. All insulation shall be applied in strict accordance with these Specifications and with factory printed recommendations on items not herein mentioned. Unsightly, inadequate, or sloppy Work will not be acceptable.

1.5 SUBMITTALS

- A. Product Data:
 - 1. Provide product description, list of materials, "k" value, "R" value, mean temperature range, and thickness for each service and location.
- B. Operation and Maintenance Data:
 - 1. Samples: When requested, submit three (3) samples of any representative size illustrating each insulation type.
 - 2. Manufacturer's Installation Instructions: Indicate procedures that ensure acceptable standards will be achieved. Submit certificates to this effect.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, protect, and handle products to the Project Site under provisions of Division 01.
- B. Deliver materials to Site in original factory packaging, labeled with manufacturer's identification including product thermal ratings and thickness.
- C. Store insulation in original wrapping and protect from weather and construction traffic. Protect insulation against dirt, water, chemical, and mechanical damage.

D. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics and insulation cements.

PART 2 - PRODUCTS

2.1 GENERAL

A. All materials shall meet or exceed all applicable referenced standards, federal, state and local requirements, and conform to codes and ordinances of authorities having jurisdiction.

2.2 MANUFACTURERS

- A. CertainTeed Corporation.
- B. Johns Manville Corporation.
- C. Knauf Corporation.
- D. Owens-Corning.
- E. Armacell North America.
- F. Unifrax 1 LLC. (FyreWrap)
- G. 3M Fire Protection Products (Fire Barrier Duct Wrap 615+)

2.3 INSULATION MATERIALS

- A. Type D1: Flexible glass fiber; ASTM C553 and ASTM C1290; commercial grade; 'k' value of 0.25 at 75° F; 1.5 lb/cu ft minimum density; 0.002 inch foil scrim kraft facing for air ducts.
- B. Type D2: Rigid glass fiber; ASTM C612, Class 1; 'k' value of 0.23 at 75° F; 3.0 lb/cu ft minimum density; 0.002 inch foil scrim kraft facing for air ducts.

- C. Type D3: Ductliner (ONLY to be used when indicated on the Drawings), Closed Cell Flexible Elastomeric Insulation equal to AP Armaflex; 1 inch thick material that has a service temperature range from –297°F to 220°F. This outdoor duct insulation meets ASTM C 534 and shall have minimum 'k' value of 0.25 Btu-in. / hr-ft2- °F at minimum density measurement at 75°F. The insulation shall be resistant to mold growth, ASTM G 21/C 1338 resistant to fungi, and resistant to bacteria growth per ASTM G 22.
- D. Type D4: Fire Rated Grease Duct Insulation (High Temperature Flexible Blanket); 1-1/2-inch thick refractory grade fibrous fire barrier material with minimum service temperature design of 2,000° F; aluminum foil laminated on both sides; with a minimum 'k' value of 0.25 and a minimum density of 6 lbs/cu ft; containing no asbestos. Listed by a nationally recognized testing laboratory (NRTL) UL to meet ASTM E 2336, ASTM E119, and with flame spread/smoke minimum rating of 25 / 50 when tested as per ASTM E84/UL 723.
- E. Type D5: Outdoor Duct Insulation (Closed Cell Flexible Elastomeric Insulation); 2 inch thick material that has a service temperature range from -297°F to 220°F. This outdoor duct insulation meets ASTM C 534 and shall have minimum 'k' value of 0.25 Btu-in. / hr-ft2- °F at minimum density measurement at 75°F. The insulation and outside surface must be protected with a white Thermo Plastic Rubber Membrane formulated to:
 - 1. Be resistant to UV, and ozone, acid rain, and physical elements produced from outdoor weather per ASTM E 96 Procedure A.
 - 2. Have a flame spread rating of 25 or less and a smoke developed rating of 50 or less when tested in accordance with the test method for surface burning in ASTM E 84.
 - 3. Show no evidence of continued erosion, delaminating, cracking, flaking, or peeling when tested in accordance with the test method for erosion resistance in UL181. Be resistant to mold growth resistance, ASTM G 21/C 1338 resistant to fungi, and resistant to bacteria growth per ASTM G 22.

2.4 INSULATION ACCESSORIES

- A. Adhesives: Waterproof vapor barrier type, meeting requirements of ASTM C916; Childers CP-82 or Foster 85-20.
- B. Weather Barrier: Breather Mastic: Childers CP-10/CP-11 or Foster 46-50 White.

- C. Vapor Barrier Coating: Permeance ASTM E 96, Procedure B, 0.08 perm or less at 45-mil dry film thickness, tested at 100F and 50%RH; Foster 30-65 or Childers CP-34.
 - 1. When higher humidity levels may be of concern, only specify the following fungus/mold resistant coating: Foster 30-80 AF (anti fungal). Coating must meet ASTM D 5590 with 0 growth rating.
- D. Reinforcing Mesh: 10x10 or 9x8 glass mesh; Foster Mast a Fab or Childers #10.
- E. Jacket: Pre-sized glass cloth, minimum 7.8 oz/sq yd.
- F. Type D4 Insulation Adhesive: Fire resistive to ASTM E84, Childers CP-82 or Foster 85-20.
- G. Impale Anchors: Galvanized steel, 12 gage self-adhesive pad.
- H. Joint Tape: Glass fiber cloth, open mesh.
- I. Tie Wire and Wire Mesh: Annealed steel, 16 gage.
- J. Stainless Steel Banding: 3/4-inch wide, minimum 22 gage, 304 stainless.
- K. Armaflex 520, 520 BLV, or Foster 85-75 contact adhesive.
- L. Armatuff 25 white seal seam tape.
- PART 3 EXECUTION

3.1 PREPARATION

- A. Verify that ductwork has been tested before applying insulation materials.
- B. Verify that surfaces are clean, foreign material removed, and dry.
- C. Maintain required ambient temperature during and after installation for a minimum period of 24 hours.

3.2 INSTALLATION

- A. Installation shall meet or exceed all applicable federal, state and local requirements, referenced standards and conform to codes and ordinances of authorities having jurisdiction.
- B. All installation shall be in accordance with manufacturer's published recommendations.
- C. Extend duct insulation without interruption through walls, floors, and similar penetrations, except where otherwise indicated.
- D. Provide external insulation on all round ductwork connectors to ceiling diffusers and on top of diffusers as indicated in the Ductwork Insulation Application and Thickness Schedule and the Drawings. Secure insulation to the top of ceiling diffusers with adhesive that meets NFPA 90A and 90B 25/50 requirements, and vapor barrier or tape to match jacket. Do not insulate top of ceiling diffuser if it is used in ceiling return air plenum or in an open space with no ceiling.
- E. Flexible and Rigid fiberglass insulation (Types D1 and D2) application for exterior of duct:
 - 1. Secure insulation jacket joints with vapor barrier adhesive or tape to match jacket.
 - 2. Install without sag on underside of ductwork. Use 4-inch wide strips of adhesive on 8-inch centers and mechanical fasteners where necessary to prevent sagging. Seal vapor barrier penetrations by mechanical fasteners with vapor barrier adhesive. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping.
 - 3. Insulate standing seams and stiffeners that protrude through the insulation with 1-1/2 inch thick, unfaced, flexible blanket insulation. Cover with reinforcing mesh and coat with vapor barrier finish coating.
 - 4. On circumferential joints, the 2-inch flange on the facing shall be secured with 9/16 inch outward clinch steel staples on 2-inch centers, and taped with minimum 3-inch wide strip of glass fabric and finish coating.
 - 5. Vapor seal all seams, joints, pin penetrations and other breaks with vapor barrier coating reinforced with reinforcing mesh.
- F. Duct Liner (Type D3):

- 1. Follow the manufacturer's installation requirements including the duct preparation for adhesive.
- 2. Secure insulation with 100 percent coverage of duct liner manufacturer's adhesive, pins and clips not more than 18 inches on center.
- 3. Secure bottom of duct insulation using alternate single and double clips. The first pin will secure the insulation and the second clip will be used to secure the cladding. Isolate the exterior clip from the cladding by using two 1/8 inch closed cell neoprene (Armaflex) washers on either side of the cladding. Predrill holes in cladding and avoid contact with pin during installation.
- 4. For joints and overlaps, fold cladding to form a double thickness hem 2 inches minimum. Seal with a non-shrink, non-hardening sealing compound.
- G. Insulation (Type D4) application for exterior of grease ducts:
 - 1. External duct wrap system requires two (2) 1.5-inch layers of lightweight, flexible wrap overlapped to provide an effective fire barrier. The barrier is installed in 24-inch or 48-inch wide sections. Insulation pins are welded in certain locations to maintain the fire barrier material up against the duct.
 - 2. Grease duct doors to be installed so the door can be removed and re installed and meet code requirements.
 - 3. Install duct wrap as tested per manufacturer's instructions to assure the duct wrap is mechanically attached per the manufacturer's spacing of bands or weld pins.
 - 4. Vertical and horizontal members of the support hanger system shall be wrapped with one layer of the insulation. Vertical and horizontal portions shall be wrapped independent of one another. The horizontal hanger shall be removed from the vertical support rods and wrapped and then immediately replaced so that an adjacent horizontal support can be removed, wrapped, and reinstalled. The end of the threaded vertical rod shall extend 6-inch past the horizontal member at the beginning of the installation.
 - 5. Penetrations: Where ducts penetrate fire rated walls, floors and roofs, the duct wrap shall be used in conjunction with a firestop system that is listed by a nationally recognized laboratory and rated for penetration of a rated wall or floor by the fire rated grease duct system used.
- H. Insulation (Type D5) application for outdoor ducts:
 - 1. Horizontal ductwork located outdoors shall be sloped at a minimum 2degree angle to prevent the accumulation of water on top of the finished

insulated duct. Support members that connect directly to the ductwork are to be insulated with this same material. Keep compression or sharp creases of outdoor insulation to a minimum by distributing the weight of the duct resting on horizontal duct support members.

- 2. Follow the insulation manufacturer's installation instructions and procedures to assure the ductwork is properly insulated and that the insulation will meet the manufacturer's warranty requirements.
- I. All ductwork, accessories, and all plenums including metal and masonry, gypsum construction, etc., shall be insulated as indicated on the Drawings, as specified herein and as required for a complete system. In each case, the insulation shall be equal to that specified and materials applied and finished as described in these Specifications.
- J. Flexible ductwork connections to equipment shall be insulated.
- K. Where vapor barriers are required, the vapor barrier shall be on the outside. Extreme care shall be taken that the vapor barrier is unbroken. Joints, etc., shall all be sealed. Where insulation with a vapor barrier terminates, it shall be sealed off with the vapor barrier being continuous to the surface being insulated. Ends shall not be left raw.
- L. Extreme care shall be taken in insulating high and medium pressure ductwork including all ductwork between the fan discharge and all mixing boxes to ensure the duct is not pierced with sheet metal screws or other fasteners. All high and medium pressure ducts in these Specifications are classified as high velocity ductwork.
- M. Where canvas finish is specified use lagging adhesive/coating to prevent mildew in securing canvas. Do not use wheat paste. Use only anti fungal lagging adhesive that adheres to ASTM D 5590 with 0 growth rating. (Foster 30-60, Childers CP-137AF). In addition, cover all exterior canvas-covered insulation with a fire retardant weather barrier mastic.
- N. Flexible round ducts shall be factory insulated.
- 3.3 INSPECTION
- A. Visually inspect the completed insulation installation per manufacturers recommended materials, procedures and repair or replace any improperly sealed joints.
- B. Where there is evidence of vapor barrier failure or "wet" insulation after installation, the damaged insulation shall be removed, duct surface shall be cleaned and dried and new insulation shall be installed.

3.4 DUCTWORK INSULATION APPLICATION AND THICKNESS SCHEDULE

Ductwork System	Application	Insulation Type	Insulation Thickness
Supply Air (Hot, Cold, Combination)	Outside of Mechanical Rooms	D1	2"
	Inside of Mechanical Rooms	D2	1-1/2"
Return Air, Relief Air, and Exhaust Air	All	D1	2"
Outside Air	Treated and Untreated	D1	2"
Supply, Return and Outside Air	Concealed Outside Building Insulation Envelope (i.e. Attic)	D1	3"
Kitchen Grease Hood Exhaust Air	All	D4	3"
Duct mounted coils	Inside of Mechanical Rooms	D2	2"
Terminal Unit Heating Coils	All	D1	2"
Air Diffusers, Grilles, Registers	Top of Device	D1	2"
Supply Air Duct	Outdoor Environment	D5	2"
Return, Exhaust Air Duct	Outdoor Environment	D5	1-1/2"

END OF SECTION 230710

DUCTWORK INSULATION

mds/11007

SECTION 23 31 10 - GALVANIZED SHEET METAL DUCTWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

A. Provide all material fabrication, labor, administration, equipment and services required for complete installation of all galvanized sheet metal ductwork indicated on Drawings and specified herein.

1.3 REFERENCES

- A. American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE).
- B. National Fire Protection Association (NFPA).
- C. Sheet Metal and Air Conditioning Contractors National Association (SMACNA).
- D. Air Diffusion Council (ADC).
- E. Air Movement and Control Association (AMCA).
- F. Underwriters Laboratories, Inc. (UL).

1.4 SUBMITTALS

A. Submit catalogue data and shop drawings for all materials and equipment listed under this section.

PART 2 - PRODUCTS

2.1 FABRICATION

A. All sheet metal ductwork shall be fabricated and installed in accordance SMACNA standards unless more stringent requirements are stated herein.

2.2 GALVANIZED SHEET METAL DUCTWORK

- A. Sheet Metal Ductwork:
 - 1. Galvanized steel ductwork shall be carbon steel, of lock-forming quality, hot dip galvanized, with regular spangle-type zinc coating, conforming to ASTM A-527/A527M-G90.
 - 2. Sheet metal gauges and reinforcement shall conform to the latest edition SMACNA HVAC duct construction standards. 26 gauge will be the lightest gauge allowed for all ductwork.
 - 3. All ductwork, including hangers, drives, flanges, accessories, etc., exposed in occupied areas shall also have a paint grip finish.

2.3 DUCTWORK SEALANT

- A. Sealant shall be non-flammable when wet, fire resistive when dry, and suitable for use in high velocity ductwork. Shall meet NFPA 90A and 90B and be UL classified. Sealant shall have a maximum 25 flame spread and 50 smoke developed compound specifically for sealing ductwork.
- B. Duct Tape will not be allowed.

2.4 DUCTWORK ACCESSORIES

- A. General: Provide duct accessories as indicated on the drawings and as required for proper system operation and balance.
- B. Flexible Duct Connections: Flexible duct connections shall be UL listed fire retardant neoprene coated woven glass fiber fabric connections, shall conform to NFPA 90A and 90B and have a maximum flame spread rating of 25 and a

maximum smoke development rating of 50. Flexible duct connectors shall be factory insulated equal to DuroDyna IDC-343 Insulflex.

- C. Manual Balancing Dampers:
 - Dampers in rectangular ductwork shall be equal to shall be Ruskin model CD-60, opposed blade type, complete with concealed linkage and extended shaft for the damper quadrant or motorized operator, 16 gauge frame and double skin airfoil blades with the equivalent thickness of 14 gauge. The axle is to be 1/2" plated hex steel with stainless steel or oil impregnated bearings. Blades shall have neoprene edge seals and compression jamb seals. Dampers listed as 8" x 10" or smaller shall be single blade.
 - 2. Dampers in round ductwork shall be equal to Ruskin model CDRS25, single blade. Blade shall be two layers of galvanized steel with the equivalent thickness of 14 gauge. A neoprene seal shall be sandwiched between the two blades. The damper axle shall be 1/2" diameter and extend 6" beyond the frame for the damper quadrant or motorized operator and shall be installed in stainless steel or oil impregnated bronze bearings.
- D. Barometric Relief Dampers: Ruskin model CBD2 adjustable counter balance damper. Damper to relieve air differentials less than 0.01" w.g.
- E. Damper Quadrants: Damper quadrants shall have indicators showing open, incremental and closed positions.
- F. Motorized Dampers: Motorized dampers shall be the same as the manual dampers with the addition of a motorized operator, specified as follows:
 - 1. Two Position Motorized dampers shall be controlled with Belimo model NF24-S-US, 24 volt, 60 in-lb torque with 75 second run time, spring return and built in auxiliary switch. Actuators shall be factory mounted to the dampers.
 - Fully Modulating Motorized dampers shall be controlled with Belimo model NF24-SR-S-US, 24 volt, 60 in-lb torque, spring return and built in auxiliary switch. Actuators shall be factory mounted to the dampers.
- G. Turning Vanes: All turning vanes shall be single thickness with a 2" radius, installed on runners with 2-1/8" blade spacing. Blades shall be 26 gauge.
- H. Adjustable Splitter and Volume Dampers: Rectangular duct mounted splitter dampers and adjustable volume extractors shall be fabricated form 16-gauge

steel with a hemmed leading edge. The trailing edge shall be pivoted on a rod or hinges. Install in accordance with the latest edition a SMACNA's Low Velocity Manual and as detailed on the drawings. Secure rod to leading edge of damper and extend rod through side of ductwork using Ventlock 603 ball joint bracket with set screw.

- I. Access Doors:
 - 1. Duct Access Doors shall be UL labeled, galvanized steel, double panel construction (paintable when duct is exposed, see Drawings), internally insulated with minimum 1-inch thick fiberglass insulation complete with gaskets.
 - a) Rectangular, Low Pressure Duct: Ductmate Industries, 24 gauge with hinged frame connection and cam lock closures. Doors shall be 16"x16" or as large as possible.
 - b) Rectangular, High Pressure Duct: Ductmate Industries FDHPC, 24 gauge galvanized panel, 22 gauge frame with 16 gauge camlock closures on all sides. Provide safety chain(s).
 - c) Round, Low and High Pressure Duct: Ductmate Industries, 22 gauge, spiral compression with conical springs and hand knobs.
 - 2. The location of the access doors shall be coordinated for easy access to the fire damper fusible links.

2.5 45 DEGREE, SQUARE-TO-ROUND TAKEOFF FITTINGS

- A. All branch duct takeoffs to a single air distribution device, shall be made using a rectangular, 45 degree takeoff that transitions to the round duct size shown on the plans. Branch ducts from a round main shall be the same as above with the exception that the rectangular portion shall match the curvature of the main.
- B. The takeoff shall be fabricated from G-90 galvanized steel, 4" W.G. construction.
- C. Takeoff shall have a 1" wide gasketed flange with pre-drilled screw holes.
- D. All sizes shall be fabricated with a damper handle insulation standoff.
- E. Take off shall be Flexmaster STOD-BO3 for rectangular duct and AirFlow #63RATD-2 for round duct or equal.

2.6 INSULATED FLEXIBLE DUCTWORK

- A. Insulated flexible duct shall be listed under UL standard 181 as Class 1 air duct and shall comply with NFPA standards 90A and 90B. The duct shall be 25/50 rated for flame spread/smoke developed.
- B. The duct shall be constructed with an acoustically transparent CPE film mechanically locked to a corrosion resistant galvanized steel wire helix.
 - 1. The duct shall be insulated with a factory applied fiberglass blanket. Insulation R-value for duct shall be R-8.0.
- C. The vapor barrier shall be a fire retardant, reinforced, metalized outer jacket with a permeance of 0.05 perm.
- D. Flexible ductwork shall be rated for 10 inwg. positive pressure and 5 inwg. negative pressure through 16" diameter. Flexible duct on sizes greater than 16" shall not be used however a flex connector shall be used to separate the sheet metal duct from the unit or grille connection. The rated temperature range shall be -20 to 250° F. The UL rated velocity shall be 6000 fpm.
- E. Insulated flexible duct shall be Flexmaster Type 1M.
- F. Flex duct shall have a 20 year factory warranty.

2.7 DUCT SUPPORTS

- A. General:
 - 1. Duct supports shall be placed within four feet on every side of each branch intersection and within two feet on either side of an elbow.
 - 2. If spacing of the building structural members is greater than the maximum allowed for duct supports, additional structural members, adequate to support duct and insulation, shall be placed to span the building structural members to provide support for the ducts.
- B. Rectangular Ductwork:
 - 1. Rectangular ductwork shall be supported at a maximum of every four (4) feet using a pair of 1" straps fabricated from 20 gage sheet metal or two

3/8" diameter all thread rods. The supports shall be attached to the duct and the building structure in accordance with SMACNA standards. This shall apply to all rectangular ducts up to a maximum half of duct perimeter of 120".

- 2. For ducts with a half of duct perimeter greater than 120", the gauge of the support straps and size of the rods shall be in accordance with SMACNA standards.
- C. Round Ductwork:
 - Round ductwork up to 36" diameter shall be supported at a maximum of every eight (8) feet using a single 1" strap fabricated from 20 gage sheet metal or 3/8" rod. The supports shall be attached to the duct and the building structure in accordance with SMACNA standards.
 - 2. Round ducts greater than 36" diameter, shall be supported by straps or rods sized in accordance with SMACNA standards.
- D. Flexible Ductwork:
 - 1. Flexible duct shall be supported by single 1" strap fabricated from 26 gage sheet metal.

PART 3 - EXECUTION

3.1 GALVANIZED SHEET METAL DUCTWORK

- A. Sheet Metal Ductwork shall be fabricated and installed per the latest edition of the SMACNA HVAC duct construction standards and the ASHRAE Handbook.
- B. All ductwork shall be supported in accordance with SMACNA standards. All threaded rod supports shall be double nutted.
- C. Duct transitions shall be fabricated and installed per SMACNA standards and shall not choke flow or reduce the free area of the duct.
- D. All rectangular duct elbows shall be fabricated in accordance with either of the following:
 - 1. Radius Elbow: All radius elbows shall have a centerline radius equal to 1.5 times the width of the duct. This results in an inside radius equal to the

width of the duct. Under no circumstances will radius elbows with a centerline radius of 0.5 times the duct width and an inside radius of 0.0 (90 degrees angle throat and radius heel) be allowed.

- 2. Mitered Elbow: All mitered elbows with an angle over 45 degrees shall be provided with turning vanes.
- E. All duct sizes shown on plans are net free area. Contractor shall allow for insulation thicknesses.

3.2 DUCT SEALANT

A. All duct systems shall be sealed to meet SMACNA Seal Class B. All transverse and longitudinal seams in all ducts shall be sealed.

3.3 FIELD QUALITY CONTROL

- Duct Cleanliness Installation of ductwork under this section shall comply with the "Intermediate" requirements defined within the SMACNA "Duct Cleanliness for New Construction Guidelines" (2000). It is the responsibility of the installing contractor to wipe down the interior of the duct prior to installation and to cap all open duct ends once installed.
- 2. Leakage Tests:
 - a) Leakage tests shall be performed on all systems.
 - b) Testing methods shall be in accordance with the SMACNA HVAC Duct Leakage Test Manual. The scope of testing will exceed the recommendations of the Manual.
 - c) Representative sections totaling no less than 25% of the total installed duct area for the designated pressure class shall be tested. Should any portion fail to achieve the designated leakage rate, an additional 25% percent of the total installed duct area shall be tested. Should any portion of this additional duct fail to achieve the designated leakage rate all duct must be tested.
 - d) All sections shall be selected by the building owner or the designated representative of the building owner.
 - e) Positive pressure leakage testing is acceptable for negative pressure ductwork.

f) Any duct failing the pressure test will be resealed and retested, at no extra expense to the owner, until the appropriate leakage rate is achieved.

3.4 DUCTWORK ACCESSORIES

- A. Flexible duct connections shall be installed on all ductwork required to be attached to motor driven equipment.
 - 1. The ends of the flexible connection shall be overlapped and sealed, to prevent air leakage, per the manufacturer's recommendations.
- B. Manual Balancing, Splitter and Quadrant Dampers:
 - 1. All dampers shall be installed so that damper blades have a full range of movement without interference or binding. Damper quadrant shall be located to provide easy access.
 - 2. Provide reinforcement to damper as required so that damper remains stable in the airstream without rattling.
- C. Turning Vanes:
 - 1. Turning vanes shall be installed in all mitered elbows with an angle greater than 45 degrees.
 - 2. The trailing edge of the turning vanes shall be installed tangent to the air stream.
 - 3. All individual vanes shall be installed on vane rails.

3.5 RECTANGULAR-TO-ROUND TAKE-OFFS

- A. Rectangular-to-round take-offs shall be installed in accurately cut openings in the sheet metal duct work.
- B. Rectangular-to-round take-offs shall be sealed for the pressure class required.
- C. The quadrant damper shall be checked for free movement and left in the full open position after the take-off and insulation is installed. Test and Balance Contractor shall set final damper position.

3.6 INSULATED FLEXIBLE DUCTWORK

- A. The length of flexible duct work shall not exceed 5 feet. For lengths of duct required over 5 feet, the remainder shall be galvanized steel round duct.
- B. Flex ducts shall be connected in the following manner:
 - 1. Flex inner duct shall be duct taped, with standard gray tape, first then duct draw band strap applied.
 - 2. Flex duct insulation shall be butted to connection over flex inner duct. Duct draw band strap shall be applied then taped over with FSK duct tape.
- C. Bends in flexible duct shall be made with not less than 1 duct diameter centerline radius. Extend flexible duct beyond end of sheet metal connection before bending.

END OF SECTION 233110

SECTION 23 43 19 - ELECTRONIC AIR PURIFICATION SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide electronic air purification systems as indicated and scheduled on the Construction Drawings and in accordance with the Construction Documents.
- B. Section includes:
 - 1. Bi-Polar ionization electronic air purifiers.
 - 2. Codes: Perform all work in accordance with the latest applicable codes and standards:
 - a) International Codes Council
 - (1) International Building Code (IBC).
 - (2) International Fire Code (IFC).
 - (3) International Mechanical Code (IMC).
 - (4) International Energy Conservation Code (IECC).
 - 3. Reference Standards: Perform all work in accordance with, but not limited to, the following standards:
 - a) American National Standards Institute (ANSI)
 - (1) ANSI/AHAM AC-1 2002
 - (2) ANSI/ASHRAE 52: Method of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size.
 - (3) ANSI/ASHRAE: 62.1: Ventilation for Acceptable Indoor Air Quality.
 - (4) ANSI/ASHRAE: 62.2: Ventilation for Acceptable Indoor Air Quality in Low-Rise Residential Buildings.
 - (5) ANSI/ISA-71.04-2013 Environmental Conditions for Process Measurement and Control Systems: Airborne
 - b) United States Food and Drug Administration. Department of Health and Human Services

- (1) 21CFR801.415: Special Requirements for Specific Devices, Maximum Acceptable Level of Ozone.
- c) EU Standards
 - (1) EN 60335-2-40:2003
 - (2) EN 61000-6-3:2001
 - (3) EN 61000-6-1:2001
- d) National Electrical Manufacturers Association (NEMA).
- e) National Fire Protection Association (NFPA)
 - (1) NFPA 70: National Electric Code
- f) OPA
 - (1) OPA 2807-10
 - (2) OPA 2808-10
- g) Underwriters Laboratories Inc. (UL)
 - (1) UL 1995 Heating and Cooling Equipment
 - (2) UL 867 Standard for Electrostatic Air Cleaners
 - (3) UL 2043 Standard for Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces
- h) USEPA US ENERGY STAR Certification

1.2 SUBMITTALS

- A. Product Data: Submit manufacturers' product data and current literature for each bi-polar ionization air purifiers, including the following:
 - 1. Specification sheets for each type of bi polar ionization generator indicating construction sizes and mounting details.
 - 2. Technical product data, including rated capacities of selected model clearly indicated.
 - 3. Performance data for each type of plasma device furnished.

ELECTRONIC AIR PURIFICATION SYSTEMS

- 4. Product drawings detailing all physical, electrical and control requirements.
- 5. Model numbers.
- 6. Copy of UL 867 independent ozone test.- Standard 40 Revision 2013
- B. A schedule of ion generators indicating:
 - 1. Model number.
 - 2. Number of each type required for each unit and application
 - 3. System served.
- C. Operating and Maintenance Data: Submit O&M data and recommended spare parts lists.
- 1.3 QUALITY ASSURANCE
 - A. All bi-polar ionization air purifiers shall be fabricated by companies whose primary business expertise is the manufacture of commercial and industrialquality bi-polar ionization air purifiers. The manufacturer shall have been in continuous operation in the manufacture of the products specified for a minimum of ten (10) years. (Editor's note: All products shall be manufactured in the USA and a certificate of origin be provided if requested).
 - B. The bi-polar ionization air purifiers shall have been independently tested by a third-party to ANSI/AHAM AC-1 2002 and provide a minimum Clean Air Delivery Rate (CADR) performance of 125 Dust CADR and 190 Mold CADR.
 - C. The air purifiers shall be tested to and comply with UL Standard 867 Standard 40 Revision 2013 and Food and Drug Administration 21CFR804.415 with respect to ozone emission.
 - D. Each submittal shall be provided with documentation certifying that all materials, products, components and test reports are in compliance with the design requirements for this project.

1.4 DELIVERY, STORAGE AND HANDLING

- A. All products stored, whether stored offsite or delivered to the site, must be kept in factory packing with shipping retainers and positioning devices in place until installation. Equipment that is subject to damage from moisture must be stored indoors with factory covering in place.
- B. Identify on outside of container type of product and location to be installed.
- C. Handle all products with care and protect them from damage due to construction activities, weather, dirt, water, chemicals, etc.
- D. Protect products and materials from entry of foreign materials by use of temporary covers, wrappings, plugs, etc.
- E. Store products and materials off of floors on raised platforms to protect them from water damage.
- F. Products and materials that become damaged in the opinion of the Engineer may be rejected and shall be repaired or replaced by the Contractor at no additional expense to the Owner.

1.5 WARRANTY

- A. Furnish a one (1)-year manufacturer's warranty against manufacturing defects for all systems and components.
- B. Warranty period shall initiate upon Final Acceptance by Owner.

1.6 COMMISSIONING

- A. Commissioning of the bi-polar ionization air purifier shall include the following:
 - 1. Compliance of the installation with code requirements.
 - 2. Compliance with the design and specification requirements.
 - 3. System commissioning shall include ion level measurements to ensure that these design increase levels have been achieved.
 - 4. Real time IAQ monitors that measure at a minimum CO2, Temperature, RH, Pm 2.5, and TVOC, IAQ sensors must be placed in the occupied space in the

4' to 7' breathing zone to measure IAQ within the space. AtmosAware IAQ monitors are basis of design.

- 5. Compliance with the performance requirements.
- 6. Compliance with the manufacturer's installation requirements.
- 7. Verification of accessibility.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Being listed herein as an acceptable manufacturer does not permit the manufacturer to provide standard manufactured equipment that does not comply with the performance and/or physical-characteristic requirements of the Construction Documents.
- B. All substitutions must be submitted for review 10 days prior to project bid and must be accompanied by a Letter of Equivalency certifying the product's equivalency in all performance and physical characteristics to the products listed herein. The proposed substitutions shall be inclusive of all cost and physical implications throughout the project. Under no circumstances should the substitution result in added cost to the project Owner, Architect or Engineer(s). Should the substitution be approved, neither the project specifications nor the Construction Documents will be revised to reflect the substitution.
 - 1. Bi-polar Ionization Air Purifiers
 - a) AtmosAir.Solutions
 - b) Prior approved equipment will be issued via addendum prior to project bid.

2.2 GENERAL REQUIREMENTS

- A. Provide bi-polar ionization air purifiers of the size, capacity and performance indicated on the Construction Drawings. The units shall be completely prewired and ready for final connections.
- 2.3 BIPOLAR IONIZATION AIR PURIFIERS

- A. Each bi-polar ionization air purifier shall be capable of effectively reduce and/or agglomerate microorganisms throughout the ductwork and interior spaces served by the bipolar system (including mold, bacteria, vapors, viruses and other airborne particulates), controlling gas-phase contaminants including Volatile Organic Compounds (VOC's) generated from human occupants, building structure and furnishings, and reducing static space charges.
- B. Relative humidity from 0% to 99% shall not cause damage, deterioration or dangerous conditions within the purification system.
- C. Operation of the electrodes or bi-polar generator unit shall conform to ASHRAE Standard 62 and 21CFR801.415; respect to ozone generation. The generator unit shall provide a minimum of 86% reduction of 3 micron and smaller particles. Independent testing performance criteria shall be provided within the submittal. Operation of the bi-polar ion generator shall not produce ozone in excess of ambient levels or more than 0.05 ppm when operated at its maximum high voltage output with the minimum number of ion tubes required to treat the total amount of air delivered by the associated HVAC system. Air purification system shall include controls to automatically limit voltage to assure adherence to the above ozone limit.
- D. Each unit shall include the required number of electrodes and power generators sized to the scheduled capacity of the duct and/or air handling unit. Electrodes shall be installed in pairs and include insulators to create the required dielectric. The dielectric shall consist of suitable organic or inorganic non-corrosive insulation material so that the presence of water vapor, gasses or airborne particles will not affect the dielectric value. The electrodes shall be installed into a tube base with suitable bonding material and be hermetically sealed to prevent moisture penetration. The tube base shall include an external molded ring, which seals the tube base to the socket which shall be water/moisture proof. Needlepoint Ion generators shall not be permitted.
- E. The bipolar ionization system shall be designed to increase ionization levels in the areas served by the handlers, ducts and/or plenums where Bi-Polar Ionization systems are installed. The acceptable ionization level increase in such areas shall be between 500 and 1,500 ions per cubic centimeter as measured by an Alpha Labs air ion counter model AIC 2.

- F. The operation of the air purification system shall be through bi-polar ionization utilizing association/disassociation process. It shall operate in such a manner so that agglomeration or precipitation of airborne particulates shall not be permitted to collect on occupants, walls or furnishings by virtue of its operation.
- G. Variations in the quantity of air exchange shall not be increased due to requirements of the bi-polar ionization air purifiers.

2.4 REAL-TIME INDOOR AIR QUALITY MONITORING SYSTEM

- A. Air Monitors
 - 1. AtmosAware Indoor Air Quality Monitors
- B. AtmosAware Real time IAQ monitors measure at a minimum CO2, Temperature, RH, Pm 2.5, and TVOC, IAQ sensors must be placed in the occupied space in the 4' to 7' breathing zone to measure IAQ within the space.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install bi-polar ionization air purifiers of capacity and sizes as indicated on the Construction Drawings, and in accordance with the manufacturer's recommendations based on the air flow rate of the air handling system and the size and characteristics of the space(s) being served.
- B. Install bi-polar ionization air purifiers with required clearance for service and maintenance.
- C. Provide access to the ionization tubes for inspection and cleaning.
- D. Seal penetrations of plenums and/or ducts with shaped flanges and with flexible gaskets and/or grommets.
- E. All equipment shall be assembled and installed in a workman like manner to the satisfaction of the Owner, architect, and consulting engineer.

- F. All interconnecting control and power wiring shall be completed by the Instrumentation and Control for HVAC Contractor.
- G. Any material damaged by water or moisture shall be replaced at no cost to the Owner, Architect or Engineer(s).
- H. Where required, provide seismic restraints as specified in Section 23 05 48.13 -Seismic Controls for HVAC Piping, Ducts and Equipment and Section 23 05 48.16
 - Vibration Isolation for HVAC Piping, Ducts and Equipment.

3.2 CLEANING AND PROTECTION

- A. Comply with Division 01 requirements for cleaning and protection of installed work.
- B. Upon completion of the installation, remove all protective materials.
- 3.3 INSPECTION AND STARTUP
 - A. Manufacturer shall provide the services of a direct factory Field Engineer (not salesmen or agents) to supervise the starting, testing, adjusting of all controls and safeties and verifying the proper operation of all units.
 - B. Start up each unit in the presence of the Owner's operating personnel and verify the correct operation of all safety devices, operating controls and auxiliary equipment.

3.4 TESTING, ADJUSTING AND BALANCING

- A. All testing, adjusting and balancing shall be in accordance with the requirements of Section 23 05 91 Testing, Adjusting and Balancing for HVAC.
- B. Make all necessary adjustments to each unit prior to the unit being put into service.
- 3.5 OPERATING AND MAINTENANCE INSTRUCTION

- A. Provide all operation and maintenance instructions and manuals for each type of system and/or piece of equipment as indicated and scheduled on the drawings and in accordance with Section 23 05 00.
- B. Operation and maintenance manuals shall be submitted at least 90 days prior to approval of first unit.

END OF SECTION 23 43 19

SECTION 260000 - ELECTRICAL WORK

PART 1 - GENERAL

- 1.1 GENERAL CONDITIONS:
 - A. The accompanying General Conditions shall apply to and form a part of this Section.
- 1.2 CONTRACTOR QUALIFICATIONS:
 - A. Qualified electrical contractors shall have been in business as an electrical contractor five (5) years prior to date of opening bids. Employees of a general contractor will not be acceptable for this section of work.
 - B. All electrical contractors whose submitting bids for this project shall be licensed as an electrical sub-contractor in accordance with the state of Alabama licensing board for general contractors.
 - C. The electrical contractor shall use state of Alabama licensed masters, journeymen, and apprentices that are professional craftsmen in the applicable field and provide documentation. A licensed master electrician shall observe/perform all work and shall be on site when work is being performed.
 - D. The electrical contractor shall possess and provide proof of insurance with coverage and limits meeting or exceeding those prescribed under the laws of the state of Alabama for liability and workers' compensation.

1.3 GENERAL REQUIREMENTS:

- A. Work under this division is shown on "E" series drawings and specified herein. Drawings and specifications are complimentary, install work called for by one as if called for by both.
- B. Obtain and pay for all permits required for this work.
- C. Electrical work to comply with latest edition of National Electrical Code, National Electrical Safety Code, Applicable Building Code, local ordinances, and other standards indicated herein.
- D. Visit site to determine what existing conditions affect work, and include necessary work in bid.
- E. Furnish written guarantee to Owner covering all equipment and work installed this division for one year from date of acceptance by Owner. Instruct Owner in operation of all equipment installed in this division.
- F. Architect will judge quality of workmanship, inferior work shall be redone and shall not be basis for change order.

- G. Architect will make observations of work. Provide labor and instruments required for these observations as directed by Architect.
- H. On completion, entire wiring system will be tested for proper operation.
- I. Maintain service to occupied spaces in building at all times. Any interruption of service shall be approved by Owner in writing 5 days prior to interruption. Include necessary overtime work in bid.
- J. Keep set of clean blue line prints at job site and mark any changes in circuit work, equipment location, etc. Turn over drawings to Architect at time of final observations.
- 1.4 BASIC MATERIAL AND METHODS:
 - A. All materials, equipment, and systems shall be new and have UL label or listing.
 - B. Base quality and operation of materials and equipment on specified items. Install substitutions for specified items only if approved by Architect.
 - C. Submit six (6) copies of shop drawings for all material and equipment to Architect for review within thirty (30) days of contract signing.
 - D. Furnish and install materials and equipment approved equivalent to the following items:
 - 1. Raceways:
 - a. Galvanized Rigid steel or Intermediate Grade steel conduit (IMC):
 - (1) Use for feeders and circuits run underground and in concrete; circuits exposed to mechanical damage or moisture.
 - (2) Terminate with double locknuts and O.Z. Type IB bushings in dry locations and watertight hubs in wet locations. Join with threaded fittings. Do not split fittings underground.
 - b. Electrical Metallic Tubing (EMT):
 - (1) Galvanized steel tubing, use for feeders; all circuits; overhead in dry locations only; auxiliary and control circuits; telephone circuits. Terminate EMT with steel set screw insulated throat fittings.
 - c. Approved Manufacturers Steel Conduit, IMC and EMT:
 - (1) Triangle; Southwire; ETP; Republic; Wheatland.
 - d. Flexible Steel Conduit:

- (1) Spirally wound interlocked steel raceway, National Electrical Products "Greenfield". Use for interior dry locations for final connections to vibrating equipment (motors, transformers, etc.). Terminate with galvanized steel compression fittings.
- e. Weatherproof Flexible Steel Conduit:
 - (1) Same construction as flexible steel conduit above except with PVC coating, Anaconda "Sealtite". Use in exterior and wet locations for final connections to vibrating equipment. Terminate with galvanized steel compression fittings.
- f. PVC conduit, Schedule 40; Carlon; Sedco or approved equal. Join and terminate with solvent type fittings. Use PVC conduit; underground where shown on drawings.
- 2. Outlet boxes to conform to UL Standard No. 5l4, constructed of sheet steel, 4" square x depth as required for wall outlets and 4" octagonal x depth as required for ceiling outlets. Provide necessary plaster frames. Use square cut outlet boxes without knockouts to give finished appearance in exposed work, Wiremold or equal.
- 3. Construct pull and junction boxes per NEMA standards; size per National Electrical Code; galvanized finish with screw covers, 14 gage steel minimum. Provide gasketed cover for weatherproof boxes.
- 4. Conductors to consist of 98% conductivity copper, #8 AWG and smaller solid, #6 AWG and larger stranded, with NEC 600 volt type THW, THWN, XHHW or approved equivalent.
- 5. MC Cable may be used for 20 and 30 amp branch circuits where run in gyp board partitions and above accessible ceilings. Homeruns shall be in conduit.
- 6. Provide covers on outlets. Use galvanized steel covers in unfinished areas. Use .04" thick type 302 stainless steel device plates in finished areas, Sierra, or approved equivalent.
- 7. Motor starters furnished by others, installed by Electrical Contractor. Control wiring installed by the Control Contractor, except as shown on electrical drawings.
- 8. Provide new circuit breakers in existing panels for over-current protection of feeders and branch circuits where shown. Use thermal-magnetic, molded case type breakers rated for 480 volts, and with interrupting rating to match existing breakers in panel.
- 9. Provide new complete and accurate typewritten directory for panels requiring modified circuits.

- 10. Safety Switches:
 - a. Use 240 or 480 volts, heavy duty type with quick-make, quick-break mechanism, fusible or non-fusible as shown. Use NEMA I enclosure inside building; Use NEMA 3R enclosure where exposed to moisture. Use horsepower rated switches for motors. Standard product of General Electric, Square "D", Siemens, or Cutler-Hammer. Use Bussman "Fusetron" fuses; size as shown.
- 11. Luminaires:
 - a. Support luminaires from structural members of building, independent of ceiling. Support grid type luminaires at all four (4) corners of (1' x 4' and 2' x 4') fixtures to structure. Earthquake clips alone will not be acceptable
 - b. All fixtures to be LED type.
 - c. All drivers are to be constant-current unless stated otherwise.
 - d. Submittal page must include the following information.
 - e. Total input wattage for all lumen output values.
 - f. Total input current for all lumen output values.
 - g. A listing of all output currents used for all drives (IE: 300 MA/500 MA/700 MA).
 - h. Minimum power factor for each wattage.
 - i. Operating temperature ranges for each wattage.
 - j. Luminaire light output, efficacy and system wattage for all color temperatures offered.
 - k. L70 reports for each lumen output and color temeperature offered.
 - I. IES photometric reports for each lumen output and color temperature utilizing LM79 standards.
 - m. All fixtures to have 5-year manufacturer's warranty. Warranty information and what items are covered, (IE. LED module and drivers) shall be included.
- 12. Distribution Panels:
 - a. Dead front cover with lockable door, molded case thermalmagnetic circuit breaker distribution type; 98% conductivity copper

or 61% conductivity electrical grade aluminum bussing, sized based on 65 degrees c temperature rise above 40 degrees c ambient, braced to carry current equal to highest interrupting rating of devices in panel; 20 inches wide x 5-3/4" deep minimum; breakers with minimum interrupting rating shown on plans at highest incoming voltage; construction in accordance with applicable nema standards. Standard product to be manufactured by General Electric, Square "D", Siemens, or Cutler-Hammer. Use vertical, consecutive circuit numbers. Provide typewritten directories describing circuits.

- 12. Dry Type Transformer:
 - a. Furnish and install a ventilated 480V Delta to 208/120V 'Y' connected dry type transformer as shown on the drawings and described herin.
 - b. KVA rating shall be as shown on the drawings.
 - c. Transformer shall be equipped with (2) 2-1/2% FCAN taps.
 - d. Class 220 insulation, 150°C rise above 40°C ambient.
 - e. Floor mounted transformer smaller than 112.5KVA shall be mounted on shear-flex pads, size as required. Transformers larger than 112.5KVA shall be installed on spring isolaters.
 - f. Use liquid tight flexible conduit for final connection to transformer.

1.5 TYPE OF INSTALLATION:

- A. Run circuits in conduit, type as described above for specific locations. Support conduit with galvanized or painted clips and hangers, Caddy or equal. Support conduit independent of furred ceiling construction. Conceal conduit work in finished areas and run exposed in unfinished areas. Install conduit work neatly. Architect will judge quality of conduit installation. Connect vibrating equipment with flexible conduit. Provide conduit expansion joints in 2" and larger conduits crossing building expansion joints. Support boxes in metal stud walls with Caddy "BHA" bar hangers.
- B. Connect wiring complete. Install wiring cabinets, panels, etc., neatly. Splice conductors #10 AWG and smaller with screw-on, solderless, insulated connectors, 3M "Scotchlock" or equivalent. Splice conductors #8 AWG and larger with copper alloy, bolted connectors, "Versalink" or "Versatap" as required. Wrap splices and taps with rubber and electrical tape to insulate to 600 volts. Color code conductors black, red, blue, orange, white and green.
- C. Bond and ground cabinets, enclosures, neutral, etc., as required by National Electrical Code. Use conductors similar to power wiring described above. Make connections with copper alloy or bronze connectors, Burndy or equivalent. Use

bolted or screw-on type connections. Coat ground connections between dissimilar metals with epoxy resin sealer. Install ground wire in circuits indicated and bond to all cabinets, boxes, devices, etc. Install ground conductor per NEC in PVC conduit.

- D. Do all cutting and repairing of walls, floors, etc., for the electrical work. Repair work cut comparable to adjacent surfaces. Architect to judge quality of cutting and repairing.
- E. Excavate and backfill for work in the division. Avoid existing underground utilities. Repair if damaged. Repair work cut comparable to adjacent condition, including new sod, shrubbery, paving, etc. Architect will judge repair work.
- F. Provide UL listed fire stopping when work passes thru fire rated assemblies.
- G. Provide power to all items requiring electrical connections whether shown on electrical drawings or not. Contractor shall review all contract documents, verify, and provide:
 - 1. Proper electrical connections furnished.
 - a. Voltage
 - b. Ampacity
 - c. Connections to fire alarm as required by code.

1.6 MARKING:

- A. Identify each starter, (including starters furnished under Mechanical Section), panelboard, cabinet, control device, control panel, breaker, disconnect and safety switch with 1/4" high black letters cut in a white laminated phenolic strip. Attach to enclosure with two (2) metal screws.
- B. Nameplates required for other items in this Division similar to those described above.
- 1.7 CONSTRUCTION IN EXISTING AREA:
 - A. Provide continuous uninterrupted electrical service to existing outlets and apparatus. Provide necessary temporary wiring installed in a safe approved manner to maintain said service.
 - B. When interruptions are required, obtain approval from Owner in writing ten (10) days prior to interruption. Include schedule of work to be performed and time required to accomplish same in request. Work during service interruptions shall occur after normal hours. Include premium (overtime) labor in <u>Bid</u>.
- 1.8 FIRESTOPPING:
 - A. Materials:
 - 1. ASTM E119 and/or ASTM E814 to achieve a fire rating as noted on drawings. All fireproofing shall be UL classified for the appropriate UL

system number.

- B. Surface Burning:
 - 1. ASTM E84 with a flamespread smoke developed rating of 0/5.
- C. Manufacturers:
 - 1. 3M brand CP25 fire barrier caulk, CS195 composite sheet, FS195 wrap/strip, RC-1 restricting collars, interim fire dam 150 caulk or moldable putty. Other approved manufacturers are FE "Pensil" Systems and Dow Corning fire stop systems.
- D. Primer:
 - 1. Type recommended by firestopping manufacturer for specified substrate surfaces.
- E. Installation:
 - 1. Seal holes or voids made by penetrations to ensure an effective smoke barrier. Install material at floors, walls or partition openings which contain penetrating sleeves, piping, ductwork, conduit and other items requiring firestopping.
- 1.9 FIRE ALARM:
 - A. Furnish complete alteration and additions to the existing Simplex fire alarm system shall comply with the requirements of the current local edition of NFPA 72. All new devices shall be compatible with existing and of same manufacturer as existing system. Install wiring for fire alarm in conduit, minimum of 3/4" diameter. Upon completion of installation, re-test the system and provide certification of compliance. Provide Shop Drawing showing all new devices, wiring and connection to existing system. Provide updated battery calculations as described in NFPA 72.
 - B. Test existing system and notify engineer of any improperly operating conditions and make arrangements with Engineer for repairs.
 - C. Additions to systems shall be sold by, and installation be supervised by, Manufacturer's authorized factory-trained Technician. Provide all required components to existing for it to handle additions and operate properly.
 - D. Manufacturer shall provide Shop Drawing of alterations and additions. Shop Drawings shall consist of:
 - 1. Floor plan with all devices and their required conduit and wire;
 - 2. Cuts of each component added;
 - 3. Verification existing system can handle modification;
 - 4. Components necessary to add to existing main panel if any required;

- 5. Battery calculations.
- 6. Approval by local authorities.
- E. Test entire system after completion for proper operation and certify system is in compliance with code and is working.

1.10 CODE COMPLIANCE:

- A. All electrical systems shall be installed in compliance with all applicable codes. This specifically covers:
 - 1. Installing equipment to meet code clearances (adjust equipment as required, notifying engineer for approval or submitting sketch).
 - 2. Verifying and respecting clearances of other components, HVAC, plumbing, etc.
 - 3. Meeting all local interpretations of codes.
- B. No additional compensation will be allowed for compliance with meeting codes.

END OF SECTION 260000